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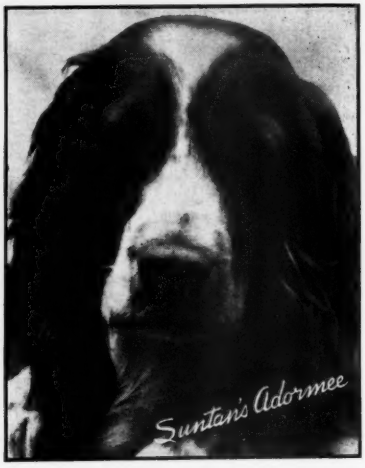

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D. M. Campbell, Editor A. T. Kinsley, Associate Editor
H. J. Mostyn, 1265 Broadway, New York, Eastern Representative

Spirochaetes occur in five diseased conditions common in farm animals—schirrus cord, bull nose and black scour in swine, thrush in horses and foot-rot in sheep. Arsenic, administered internally, has a destructive influence on spirochaetes.

All anti-sera should be administered in large quantities; particularly is this true of tetanus antitoxin. It is far better to give two massive doses 12 to 24 hours apart, than to give smaller doses and repeat them oftener. Further, the annoyance of repeated does of antitoxin should be spared the animal suffering from tetanus.

Truly no one will deny that the practitioner is the foundation upon which the veterinary profession rests. Any circumstance or combination of circumstances that interferes with the practitioner's independence of operation within that field must weaken the entire structure.

To be properly grounded, the veterinary practitioner should be familiar with the history of his profession and with the origin and development of the live stock industry that it serves. A study of these will strengthen his confidence in himself. It will convince him that veterinary service is indispensable and without it present civilizations would crash.

Human medicine and veterinary medicine go hand in hand. There are dozens of problems in human medicine that cannot possibly be solved without the aid of veterinarians and veterinary science. Physicians and public health officials realize this more today than ever before.—*D. J. Davis, Dean, College of Medicine, University of Illinois.*

The appearance of Rocky Mountain spotted fever in Illinois this summer emphasizes the growing importance of modern transportation in the spread of communicable diseases. Faster trains, better highways, high powered motor vehicles and airplanes make it easier and easier for infected people, animals and insects to be transported great distances. — *Illinois Health Messenger.*

Beware the doctor who advertises! Beware the doctor who passes out handbills! Beware the doctor who has a big advertising signboard or a big electric sign in front of his office! Beware the man who guarantees a cure or who promises that he can cure any serious disease in one or two treatments! Beware the man who has no fixed residence and who moves from one city to another! Beware especially the one who claims special knowledge that no other physician possesses! All are likely to be quacks and are not to be trusted.—*Hygeia.*

The veterinary practitioner has always been the contact man for our profession; he must deal not only with the diseases and parasitisms of live stock in a practical and scientific manner, but with the general public as well. Be it remembered that the general public is a mass group of varied interests, impulses and prejudices and still bound to the lingering superstitions of an age that enshrouded medicine in mystery and magic as it marched down the musty centuries, even to modern times.

* * * *

The veterinary practitioner must cultivate his field, mindful that every veterinary service that is slighted or neglected by those of the profession, will be avidly seized upon and exploited by an increasing band of pirates and fakers who, in the guise of protectors, prey upon agriculture. The veterinarian must meet in a business and professional manner every demand for legitimate service that comes within his field of usefulness.—*N. F. Williams.*

* * * *

Our State Department of Agriculture has already shown its willingness to coöperate by sponsoring, introducing, encouraging and now enforcing the Iowa state cream grading law. Federal and state inspectors are actively at work enforcing the provisions of this statute, inspecting creameries and condemning cream unfit for human consumption. Where there are several condemnations, it seems that very definite improvements show up almost immediately.—*Ray Murray, Secretary.*

* * * *

The basic training given the veterinarian has placed him in the position that he may with slight additional specialized training, become the one best equipped to handle the milk control work. When the veterinarian has had such specialized training, he is the best equipped person to conduct or supervise the complete control over food products of animal origin. This fact is recognized by the Army and should be so recognized by our civil governments as well. *D. F. Coyner, Pres. California Ass'n of Dairy and Milk Inspectors.*

It requires 129 employes in the secretary's office of the American Kennel Club to handle the work, principally that of keeping the records of pure-bred dogs in the United States and of licensed dog shows.

* * * *

There were 298 dog shows (licensed by the A. K. C.) in the United States in 1935. It is predicted that the number for 1936 will reach 325. In 1880, there were but five shows; in 1890, 14; in 1900, 27; in 1910, 89; in 1920, 117, and in 1930 there were 241. In 1876 there were but six breeds in the A. K. C. stud book; in 1890 there were 40; in 1900, 61; in 1910, 63; in 1920, 75; in 1930, 92. At present 117.

* * * *

USUAL EFFECT OF A RABIES SCARE

Approximately 10,000 dogs were killed at the Philadelphia dog pound during the recent three-month rabies quarantine. Nearly half of these dogs were brought to the pound by worried or frightened owners. Thus the presence of rabies is responsible for 4,000 to 5,000 fewer dog owners (probably twice this number, since many would dispose of their dogs without taking them to the pound) in a single city. A majority of them will own dogs again, only when rabies is eradicated or brought under some semblance of control by the dog industry.

Rabies is more prevalent in Chicago at this time than at any time since 1928. So far there have been only three human deaths in the present outbreak and there is little public support of the strenuous efforts of the Health Department to control the situation. A rabies quarantine of Cook County is imminent at this writing—the stage is set for hysteria.

The Health Department of Chicago asserts that there are 50,000 stray dogs in the city. One hundred persons are bitten daily by dogs, of which an average of 10 take the Pasteur treatment. About 650 dogs that have bitten persons are constantly under observation (15 days) at the dog pound. About 100 uncalled for dogs, a number insufficient to decrease materially, the number of strays, are destroyed daily.

SAUSAGE MAKING

Before the dawn of history the Greeks served a sausage which resembled a frankfurter. In the "Odyssey," Homer describes it as a favorite food, and Aristophanes gave it dramatic recognition in some of his comedies. Modern sausage manufacture really dates from Roman practice. Even during the time of Augustus Caesar a large number of varieties were prepared —both fresh and cured sausages. Sausage was always in evidence at Lupercalian feasts and other occasions of hilarity—so much so that the early church came to look upon sausage as a heathen and licentious instrument. A strong lobby of reformers finally put through a prohibition against sausage, but the Populus Romanus, as impatient of reformers as we today, ran sausage freely past the prohibition agents and finally mustered the necessary three-quarters votes to repeal the odious law. The development of modern sausage took place mainly in Italy and the Germanic countries. Scarcely a city of any importance exists in Italy today which does not have a type of sausage named after it—Milano, Bologna, Romano, Genoa, Salami, etc. In Germany, the cooler climate and the use of caves led to the development of fresh and cooked sausages, most of them being adapted to frying. These varieties included brat wurst, liver sausage, blood sausage, head cheese, and Berliner sausage (a ham sausage). In addition, the Germans made many varieties of summer sausage (that is, a sausage made in winter to be consumed during the summer). The Germans and Scandinavians were more partial to the milder spices than the Italians, but the rapid spread of the desire for sausage and its convenience for trade during the Middle Ages, led to a further competition for trade with the spice countries. The motivating impulse in Columbus' discovery of America was the short route to the spice countries of the Indies, while Magellan's passage south of Cape Horn, and Hendrick Hudson's search for the northwest passage alike were stimulated by the desire of a shorter trade route to the spicy Orient than the land route through Asia Minor or the water route around Africa.—*E. N. Wenworth.*

* * * *

NECESSITY FOR MEAT IN THE DIET

Leaders of the medical profession point out with increasing frequency the importance of meat in the diet. Witness a recent article by Dr. Irving S. Cutter on the dangers of eating too much indigestible roughage and not enough concentrated food, such as meat. "Man is not a grass eating animal" and "the human digestive apparatus cannot dissolve an appreciable amount of cellulose, or vegetable fibre." "Reasonable amounts of vegetables and fruits are needed but the diet also must include generous quantities of meat." Food faddists used to teach that meat was the cause of high blood pressure and kidney disorders. Dr. Cutter asserts that "the fact is that when properly prepared, meat is one of our best foods."

* * * *

HAZARDS OF LIVESTOCK GROWING LESSENED

Chemical warfare against injurious bacteria, viruses, and parasites has done much to reduce the hazards of the livestock industry. Species of livestock parasites number into the thousands and the combined battle strength of their forces runs, of course, into such large numbers as to stagger the imagination. Yet through diligent research, science has not only devised means of keeping such enemies down, but has succeeded in practically annihilating certain species.

The aggressive campaign against the cattle tick in the South has reclaimed about 91 percent of the area formerly infested with this injurious parasite.

In the western range areas where the sheep-scab mite at one time held sway over a large domain, this enemy has been routed in crushing defeat.

The aggressive drive to eradicate bovine tuberculosis has gone forward so successfully that 40 entire states are now practically free from the disease.—*J. R. Mohler.*

The education of a professional man makes only a beginning in the colleges. The major part of his training is attained after his sheep-skin has been obtained and the college doors have closed behind him. Education is a continuous process. No matter how good an education one has had, he cannot lay claim to being an educated man a few years later unless, in the meantime, he has kept his educational process going. —*W. A. Hagan.*

* * * *

Death or disease of the ovum or sperm cannot be recognized clinically unless the condition is associated with recognized clinical phenomena. However, an effort is being made to interpret the "semen picture," as well as macroscopic and microscopic changes that take place in the ovaries. In order to study semen, it becomes necessary to start with spermatogenesis and follow the steps taken in the development of the sperm. This is a tedious but essential task ahead of those who expect to make practical application of fundamental principles underlying reproduction.—*H. E. Kingman.*

* * * *

PRIMITIVE BUTCHERING

If the animal was fat, the Indians usually removed the intestines, inverted them so as to remove the contents and also to put the intestinal fat on the inside, washed them at a convenient stream and cooked crisp as a real delicacy. What we recognize as "chitterlings" apparently had early recognition among all savage tribes. In fact, the desire for the intestines, heart, liver, sweetbreads and various other glands indicates a primitive and unconscious recognition of their nutritional value long before science had proved the existence or necessity of hormones and vitamins. Perhaps this knowledge was even pre-human, for the avidity with which the carnivora seek the "vitals" of their prey, suggests an almost instinctive urge for these important agents in animal health.—*Armour's Livestock Bureau.*

Abortion [in cattle] is fearfully on the increase.—*Geo. H. Dadd, V. S.*, 1869.

* * * *

MEAT REFRIGERATION

Freezing meat for preservation naturally developed in the Arctic regions or in countries of the temperate zone during winter. Seventy-five to a hundred years ago, the practice was widespread over northern United States, and frozen beef quarters and pork carcasses are still kept in perfect condition for five months in a great part of Canada. When the refrigerator car was invented about 1876, it became possible to slaughter cattle and hogs near their place of production, and their meats could be carried over the country without deterioration. The operation of the first successful refrigerator car was the turning point in the meat industry. It made possible a regular flow of fresh meat every day from all producing countries to every consuming center on the globe. The people of the United States are as dependent upon refrigerator cars for their food supply as the people of England are dependent upon ships. Curiously enough, a veterinarian was responsible for introducing commercial refrigeration of meat in America. Prof. John Gamgee came to this country in 1868 to interest American packers in a system of meat refrigeration. Before he returned to England, United States Commissioner of Agriculture Capron, learning of Prof. Gamgee's presence in the country, engaged him to make an investigation of Texas fever, contagious pleuropneumonia of cattle and the ill effect of smut in the feed of farm animals. Prof. Gamgee's report on the lung plague with which he was familiar in Europe, is a classic. He was, however, unable to fathom the mystery of Texas fever. He visited Cornell University and while there recommended Prof. James Law for the head of the newly organized Department of Veterinary Medicine. Thus, indirectly, the invention of machinery in England for the refrigeration of meat, led to James Law's coming to America. His services here conserved meat for refrigeration in incomputable amounts.

The good physician should practice with disinterestedness, not for money, but for the good of humanity. It is not possible to covet riches and at the same time to cultivate worthily medicine, that art so noble; if a man devote himself ardently to one, he will neglect certainly the other.—*Galen.*

* * * *

A rather serious attack upon this college (New York State Veterinary College) and the veterinary profession in general was made fairly recently by an influential business executive, who is also a farmer, largely, it appeared on investigation, because he had had an unfortunate experience with a practicing veterinarian.—*W. A. Hagan.*

* * * *

THE QUALITY OF VETERINARY SERVICE CONSTITUTES ARGUMENTS FOR OR AGAINST IT

There are some important interests in this state (New York) who apparently feel that veterinary medicine could be taught to livestock owners and that the state should not be spending so much money for the education of veterinarians who are then sent out to collect fees for their services. Inasmuch as we have always opposed this idea and have insisted that private practitioners are necessary and that the service of the college to the state must necessarily be rendered largely through the practitioners that we train, there is some basis for charging against this college any shortcomings that appear in the practitioner system. As farmer education advances and these men become more exacting and critical of the service that they receive, the more necessary is it going to be that practicing veterinarians be real students, constantly striving to keep acquainted with all developments, if the college is to hold steadfastly to its present policy of rendering its service through private practitioners. In other words, the practitioner who is up to date and is giving satisfactory service to his clients is the best possible argument for private service, and the one who is failing to hold to these ideals furnishes ammunition to those who would break it. —*W. A. Hagan,* in *Cornell Veterinarian.*

Man during the last century, seems to have conquered almost everything except the elements and disease. The hurricane, the earthquake and the flood take their toll at times, but greater than these are the ravges of disease. The greatest problem of the ages is the prevention and conquering of disease.—*Pharmacal Advance.*

* * * *

Every profession has its exploiters, its cowards and its traitors. Professions are finding means to purge themselves of such undesirables. It is the duty of every profession as a matter of self preservation and in justice to the public to which it caters, to clean its ranks in no uncertain manner.—*N. F. Williams.*

* * * *

The amino acids are chemical substances that assemble themselves in certain patterns to make up the molecule that we call protein. To carry study beyond the proteins or albuminous bodies to the animo acids that make the more complex bodies is like carrying the study of molecules to atoms, to electrons, and to protons; or carrying the study of air to the oxygen, nitrogen, carbonic acid, vapor, and rarer gases that enter into the mixture.

* * * *

It must be admitted that the veterinarian lags far behind the physician in willingness to study fundamental principles that relate to disease. For this reason, many of us have come to a "stand still" in handling problems that are confronted in everyday practice. Infertility is an outstanding example of this situation. Probably no other phase of veterinary practice demands so great an effort to master the factors that influence the problem. In dealing with the ovum and the sperm, one is handling microscopic structures. The influences exerted upon these two cells are so complex that we are making slow progress in our efforts to understand them. Sperms and ova may fail to develop due to some defect in the testicles or ovaries. Death of either the sperm or ovum results in infertility, just as surely as death of the fertilized ovum, embryo or fetus.—*H. E. Kingman.*

Liability in Damages for Death of Animals

By LEO T. PARKER, Cincinnati, Ohio
Attorney at Law

UNDER various circumstances veterinarians who improperly administer to an animal, may be held liable in damages to the owner of the animal.

It is well established law that where an owner sues a veterinary surgeon because of the latter's alleged negligence, the burden is upon the owner of the animal to prove that negligence or improper treatment by the veterinarian caused the death.

Failure of the owner to introduce testimony proving negligence or lack of care always results in the veterinarian being held not liable. Also, this same rule of the law is applicable to a manufacturer who is sued by the owner of animals which die after being administered medicine manufactured by him.

For illustration, in a late case (195 N. W. 835) it was shown that a veterinarian purchased anti-hog cholera serum from a manufacturer and administered it to hogs in three different fields. All of the hogs in one field died, but none of the hogs in the other two fields were injured. The owner of the hogs filed suit against the manufacturer to recover damages.

During the trial the evidence of the veterinarian, who administered the serum, tended to show the possibility, if not the probability, of contamination of the serum, or the instrument, or the wound, during the process of vaccination. In order to prove the possible source of contamination to the jury he poured the serum into a glass tumbler and demonstrated by inserting the hypodermic needle. The veterinarian testified that in his opinion the serum, as it came to him from the manufacturer, was contaminated. Upon cross-examination, however, he admitted that his only reason for his opinion was that "I could not figure out any other way how it happened."

It is interesting to know that the higher court held the owner not entitled to a verdict, saying:

"The government inspector in charge of the manufacturing plant testified that he had used this serum on test pigs at the plant, and that there was no showing of malignant edema from the use of it. We think that the plaintiff (owner of the hogs) failed to sustain the burden that was upon him to prove the negligence of the defendant (serum producer) was the proximate cause of the injury."

Circumstantial Evidence Not Convincing

Also, in another leading case, (162 N. W. 620), it was disclosed that the owner of animals which died, after medicine was administered, sued to recover damages.

The owner introduced considerable circumstantial evidence which tended to prove that the animals had died from results of the administration, because they were healthy before and died soon afterward.

It is interesting to know that the higher court refused to hold the owner of the animals entitled to a verdict, saying:

"The burden was on the owner of the animals, of course, both to show negligence and to show that such negligence was the cause of the alleged losses. The plaintiff (owner) lays great stress upon the large percentage of loss in the herds of the plaintiff. The proof contended for by the plaintiff is wholly circumstantial. We think, therefore, that the circumstances which we have here considered fall far short of sustaining a verdict either finding negligence of the defendant (veterinarian) or that the alleged negligence was the proximate cause of the losses complained of. Briefly stated the finding of negligence is not sustained by the evidence."

Therefore, in this leading case it is apparent that ordinarily circumstantial evi-

dence is not sufficiently convincing, under the above mentioned conditions, to entitle an owner of animals to recover damages from a veterinarian for death of or injury to animals.

Ingredients Held Secret

Another important rule of the law is that neither a veterinary surgeon nor a manufacturer is compelled to divulge the ingredients administered to animals which die.

For illustration, in a late case, (199 S. W. 582), it was disclosed that a veterinarian administered a hog cholera serum to hogs which soon afterward died. The veterinarian purchased the serum from a manufacturer who recommended it as a preventive of hog cholera and prescribed the dosage and manner of administering it. The recommendation and prescription for its use was a general one, being printed on the label of the bottle containing the remedy and in circulars sent out with each bottle.

The owner of the hogs filed suit to recover damages. During the trial the veterinarian testified that he had no connection whatever with the manufacturer of the serum; that he ordered it to use in vaccinating hogs in practice; that he sent in a number of orders for this remedy during the year from time to time, and that all the directions he had for using the medicine were the general directions accompanying each bottle.

In this case the owner of the hogs demanded that either the veterinarian or the manufacturer disclose the ingredients. Also, the owner of the hogs contended that he was entitled to a verdict for damages because the hogs were healthy when the serum was administered, and soon afterward the hogs died.

However, it is important to know that the higher court refused to hold the owner of the hogs entitled to a favorable verdict, saying:

"It is pretty well established that in its incipient stage where the symptoms are discernible, it is too late for most hogs to yield to the antidote or serum. That is true of the disease, whether resulting from the usual contagion or caused by the injection of the virus. The mere fact that injury resulted from the use of this virus in the way it was intended to be used is not sufficient to prove negligence. There must be evidence from which the negligence counted on is fairly and reasonably inferable."

Also, the higher courts refused to compel either the veterinarian or the manufacturer to divulge the contents or ingredients of the remedy.

Veterinary Surgeon Negligent

Of course, a veterinary surgeon is liable in damages to the owner of animals where the testimony indicates negligence on his part.

For example, in Erickson V. Weber, 237, N. W. 558, it was shown that the owner of sheep filed suit against a veterinarian to recover damages for the death of sheep, alleged to have been caused from the negligence of the veterinarian in compounding and administering a remedy for intestinal worms.

During the trial testimony was introduced proving that the treatment was completed during the forenoon. In the afternoon the owner inspected the sheep which had been treated and discovered that some of them were dead, and others were lying on the ground with a greenish foam issuing from their mouths. During the afternoon and the following night 42 of the sheep died and 19 more died within a few days.

The owner of the sheep sued the veterinary surgeon for damages. The owner of the sheep requested another veterinarian to testify during the trial. This veterinarian when acting as a witness was asked: "What would you say was the cause of the death of the sheep that died?" He answered: Faulty administration of the medicine, or, in other words, the medicine must have gone into their lungs."

The counsel for the veterinarian who was being sued, contended that there was no causal connection between the alleged negligence in administering the remedy and the loss of the sheep. He argued that the mere fact that the sheep had died was no

evidence of any negligence on the part of the veterinarian who administered the medicine. Also, the counsel contended that the cause of the death of the sheep "was and is" unknown.

On the other hand, testimony was given to the effect that when a liquid, consisting of the ingredients used in the treatment of the sheep, is not properly administered the fluid passes into the lungs and causes strangulation and almost certain death. This testimony was substantiated by reference to a treatise on diseases of sheep by a recognized authority and bulletins of the United States Department of Agriculture on the same subject.

In view of this testimony the jury, after considering all facts, rendered a judgment against the veterinarian, and in favor of the owner of the sheep. The higher court sustained this verdict, and said:

"There was ample evidence, the contention of owner of the sheep, that the medicine was administered in a manner which, according to the opinion of experts, is usually fatal. It was the province of the experts, under the circumstances, to say whether the treatment was or was not proper. Unless it can be said that such negligence was the proximate cause of the death of the sheep, there can be no recovery. In other words, the evidence must show a causal connection between the negligence of the veterinary surgeon and the loss sustained; the proof must establish causal connection beyond the point of conjecture."

Improper Diagnosis

Another important point of the law is that when the owner of animals contends that the same die because the veterinary surgeon improperly diagnosed the disease, or administered the wrong kind of medicine, he must prove these facts otherwise he is not entitled to a favorable verdict.

For example, in a leading case, (215 Pac. 424,) it was shown that a veterinarian vaccinated hogs against cholera and within about nine days after the hogs were vaccinated, one or two of the hogs died and quite a number were sick. The owner called the veterinarian and had him make an examination of the hogs. The veterinarian then concluded that they were suffering from the "flu." He stated that the hogs should be vaccinated with a mixed infection bacterin, and did so vaccinate a number of the hogs, but not all of them were vaccinated because he did not have a sufficient amount of vaccine. However, the hogs continued to die. The owner called the veterinarian in charge of the hog cholera work in the state for the U. S. Department of Agriculture and he examined some of the dead hogs and pronounced the disease hog cholera.

The owner of the hogs sued to recover damages and contended that the veterinarian had vaccinated the hogs in an unskillful, negligent, and improper manner and that he carelessly and negligently diagnosed the disease of the hogs as flu and treated the hogs for this disease, when in fact, they were infected with cholera.

Although the lower court held the owner of the hogs entitled to a verdict, the higher court reversed the verdict, saying:

"Before it could be said that the cholera was caused by the vaccination it would be necessary to assume that the hogs had not already become infected with cholera before the treatment, and before it could be said that the serum was not of sufficient potency, it would be necessary to assume that they were in normal condition and not suffering from any other disease which destroyed their power of resistance, and that they were properly fed and cared for after the vaccination. We might just as reasonably conjecture that the death of the hogs resulted from some one or more of the above conditions as to conjecture that it occurred because of the inferior quality of the serum administered. There is no way to ascertain whether the cholera was caused by infection prior to the time the treatment was administered or resulted from the treatment."

Therefore, it is quite apparent that under no circumstances may a veterinarian be held liable for any act which the owner

contends resulted in injury to death of his animals, unless evidence is introduced which proves negligence of the veterinarian and that this negligence bore a causal relation to the death of the animals. This rule of the law is applicable to all injuries and diseases of animals.

Live Stock Remedy Peddlers

Another situation, which the average veterinarian frequently confronts, is where a stock owner, who has lost stock, consults the former for information as to the actual cause of the loss, when the stock owner admits that he administered medicine purchased from a peddler.

Generally speaking, a manufacturer of remedies is responsible for statements of an agent *only* when the testimony indicates that the manufacturer gave the agent authority to make guarantees, statements and the like. The implied authority of an agent is merely to solicit orders, and not to make unusual statements or guarantees regarding the product. Usually, the package of the remedy contains the manufacturer's guarantee and directions for administering and, therefore, any and all statements made, without authority of the manufacturer, on the part of the agent, results in the agent being solely liable. In view of the established phase of the law, since in most instances the agent either cannot be located, or if located he is not financially responsible, the stock owner is without doubt doomed to suffer the loss. This is true, also, because the directions printed upon the package are always in such broad terms that it is very difficult for any person, who suffers loss as a result of administering the remedy, to obtain a judgment against the manufacturer.

This rule of the law, with respect to liability of a manufacturer for statements of an agent, is applicable to representatives who sell both dealers and stock owners. And certainly the manufacturer cannot be held liable for loss resulting from an incorrect diagnosis made by his agent unless it were shown the agent were expressly authorized to make diagnoses for his principal, a most unlikely condition.

CONSULT VETERINARIANS CONCERNING "BLIND STAGGERS"

In hot weather, horse owners should be on the lookout for "blind staggers"—encephalomyelitis—an infectious disease which in recent years, has caused serious losses among horses and mules in the West, Middle West, and in some of the Atlantic Coast States. Before it was discovered that the disease was infectious—caused by a filtrable virus—it was known by some as "blind staggers," "brain fever," and "sleeping sickness," terms which in a rough way describe the symptoms of the disease, which affects the brain and spinal cord.

The first indication of the malady in an infected horse is a rise in temperature. This usually is followed soon by disturbed appetite, lack of spirit, and weakness. Some cases recover following this. Others develop sleepiness, grinding of the teeth, trembling of the body muscles, usually the flank or shoulder, walking in a circle, or trying to push over or plunge through any obstacle which they encounter. Later the horse may go down and be unable to rise, sometimes thrashing violently with the legs and head. Recovery is rare, when these symptoms develop.

This infectious disease may be easily confused with other diseases of the central nervous system and the veterinarian should be called at the first sign of sickness. There is no remedy that is effective in all cases. Treatment varies with the nature of the symptoms, but in this disease it is especially important to keep the animal comfortable and prevent self-inflicted injury. Immune serum, which is commercially available, if used as a curative agent must be administered very early and in large quantities. Before an animal becomes sick, a dose of the serum may protect it for a time, but this must be repeated at intervals if continued immunity is desired.

In addition, a "formalin-treated" tissue vaccine has been developed for protection against the disease. If this product is used it should be given before the disease makes its appearance, as some time is necessary for immunity to develop. Laboratory and field tests have indicated that a considerable number of animals, but not all, may be protected when injected with at least two doses of vaccine, given several days apart.

Horse owners in areas where the disease has occurred should keep in close touch with their local veterinarians.

Animals that are already affected should be isolated from healthy ones and protected against biting insects, the Bureau recommends, and all stables and other equipment should be thoroughly cleaned and disinfected with a formalin or lye solution. Present evidence indicates that the disease is spread from affected to healthy horses by mosquitoes or possibly other blood-sucking insects. It is therefore advisable, in areas where the disease exists, to stable healthy horses when not working and to protect them in every practical way against insects at all times.—*U. S. Dept. of Agr. Newspaper Release.*

The Collection Racket

By FRED MERISH,
Pompton Lakes, N. J.

RACKETS are so commonplace in business and social life that no human activity seems immune. Veterinarians, physicians, dentists and other professional men are faced with a racket too—the collection racket. The racketeering collection agency masquerades, in one disguise or another, as an accounts purchasing, accounts liquidating or discount company. Its salesmen offer to buy accounts under a purchasing plan through which the veterinarian receives a proportionate percentage of their face value depending on their age. About 30 days will be required to verify the accounts and to complete the purchase offer, so the salesman says. The contract seems to check with his statements but trick wording obscures the intent. Actually, it gives the company privilege to purchase any or all accounts, if in its opinion, the debtors are good risks or can furnish acceptable collateral. It doesn't obligate the company to pay a nickle. The accounts purchase or discount offer sweetens the proposition sufficiently to make it easy to get the accounts for collection at exorbitant rates. Once the contract is signed and the accounts turned over, the creditor can hope for little more than a dole as his share of the collections.

Beware of such collection racketeers and their promises to buy accounts for immediate cash. Their purchase plan is mere bait to snare the accounts. Their contract doesn't back up the salesman. Often the real agreement is printed in pin-point type on the back of a sheet used for listing accounts or is given seeming unimportance by means of other camouflage. After the contract is signed, it is useless to demand settlement on the basis of the salesman's promises. The agreement invariably harbors a clause repudiating any and all representations not made therein.

EXAMINATION of contracts used by these collection racketeers shows that they are drawn on a heads-I-win-tails-you-lose basis with the creditor on the short end. Service fees, docket fees, office filing fees, vary from 50 cents to $2.00 an account, whether collected or not, and may entirely eat up equities in small accounts or part-payment collections, after commissions are deducted. The salesman, of course, says nothing about this. Assignment of accounts, which these contracts call for, divests the creditor of control for a year or more; and if the accounts are withdrawn or dropped during that period, commissions are due the company. Commissions run from 20 to 50% regardless of the size of the account.

These are the main highlights and although the verbal hocus-pocus may differ in different contracts, the theme song is always the same; you are promised cash upon verification of your accounts. But, in reality, you can warble for your money—not only before it is collected, but often afterwards. Often it is harder to collect from these companies than from the original debtors. They call themselves accounts-purchasing companies but they're just collection agencies with Santa Claus whiskers.

Hundreds of complaints from every state have been received by Better Business Bureaus, chambers of commerce, business publications, trade associations, the National Retail Credit Association, member credit agencies of repute and attorneys. But it seems that these racketeers live up to their printed contracts. Their salesmen do the verbal sleight-of-hand, obviously with company connivance. They get paid so much for each account whether it is collected or not, so they are interested only in getting the signature to the contract and a list of delinquents. As a result, they seldom stop at red lights when driving home their arguments.

THIS article would be of limited use if it disclosed the disease without suggesting some preventive medicine. Here are pointers on the best methods of selecting and dealing with collection agencies.

Give preference to a local agency. It is easier to demand redress for wrongs or errors than with the far-away agency with "offices in principal cities" plus an imposing name. Reliable agencies are in every territory. Consult the local Chamber of Commerce, Better Business Bureau, telephone directory, city directory, your bank or write the National Consumers Credit Reporting Company, 1218 Olive Street, St. Louis, Mo. Members of this association cover the country. Inquiry sent to the above office should bring information regarding an accredited nearby agency. In some places the local Chamber of Commerce operates a credit and collection agency. Sign no papers giving an agency title to your accounts. Legitimate agencies accept accounts with no strings to them. You may take back your accounts whenever you wish, the agency receiving commission only on the money previously collected.

Before turning over your accounts, get a rate card. A fair average for collecting consumer claims over the country, according to a bulletin of the National Retail Credit Association, is as follows:

Payments of $100 or more	10%
Payments of $50 or more	15%
Payments of $5 to $50	25%
Payments under $5	50%
Trace claims where debtor's whereabouts is unknown	50%
Forward claims sent to other territories for collection. 2/3 goes to forwardee, 1/3 goes to forwardor	50%

Commercial claims against business organizations draw slightly higher fees. Usually the creditor advances suit costs. In some states it is illegal for a collection agency to advance suit costs. If the creditor wins, the defendant pays the costs and the creditor is reimbursed.

FANTASTIC HABITS OF PESTS

A cockroach gets an entire new skin (which is its skeleton) seven times before it grows up.

One billion germs can be raised from a single germ in the laboratory in one day.

Only female mosquitoes bite; the males sit contentedly on the bushes and suck sap.

Many germs give off two kinds of poison —a toxin when living and an endotoxin, when dead.

Many modern disinfectants will kill germs 50 or 100 times as fast as does strong sunlight.

Some household pests can live months without any food whatsoever.

Some female insects devour the bridegroom after the honeymoon. The praying mantis invariably does that. The black widow spider gets her name from that trait —she is always a widow.

Virgin births are common in the insect world. The common aphides reproduce all summer without any males in the flock.

Moths do $200,000,000 damage annually in the U. S.

It is mathematically possible for a pair of flies to have 2,000 billion descendents in a single season!

Flies are the greatest insect menace in the spread of disease. The average fly will carry one million germs on its hairy legs and body, leaving a trail of germs on whatever it lights.

One million gallons of disinfectants were used in the flood areas this spring to prevent the spread of disease. There were no epidemics such as followed floods in the last century.

There are more ants in the world than any other single creature and in many sections they are annoying household pests. Most of the ants in a colony are workers, which are undeveloped females. The males, usually winged in most species, die after mating with the queen.

MALIGNANT EDEMA TREATED WITH PURE OXYGEN

May 28, while making a call, one of my clients instructed his barn man to bring out a valuable Percheron stallion for me to see.

I noticed a small swelling upon his side, about 2½ x 2½ inches, and perhaps a half inch thick. Upon making inquiries, they told me that the evening before, while shoeing the animal, they found a small puncture, probably made by a nail, at this point where the hair was ruffed up, so they injected a small amount of tincture of iodine into it. Concluding that the swelling was due to the iodine, I gave the matter no further thought. That evening about eight o'clock the owner called me again. Upon arrival, I found an enormous swelling gravitating towards the pendulous part of the abdomen. I washed it out well by injecting peroxide of hydrogen, and made a diagnosis of malignant edema. The next morning it appeared as if you could see it swell, but there was no hydrogen sulphide smell.

I gave an unfavorable prognosis, allotting the stallion from three to five days to live. I also gave 60cc Trypacrin A (a Jen-Sal product of analine dyes) intravenously, along with peroxide injections. The owner informed me that the horse was worth $1500. I could give him no encouragement.

I had plenty of incentive to do some thinking and concluded that if peroxide of hydrogen was recommended for malignant edema, why not use oxygen. So, I procured a tank of oxygen and went back to the barn, and taking a fountain syringe tube, fastened a hypodermic needle in one end and attached the other to the tank. I turned on the gas and injected a circle around the puncture. I also made 12 to 15 punctures into the swelling on the abdomen.

The next morning, to my surprise, there was very little additional swelling and the patient was doing nicely. I continued the treatment daily along with daily intravenous injections of 60cc of Trypacrin A, and discharged the stallion at the end of a week. Quite a bit of swelling was still present, but the stallion was doing nicely and at the end of the second week, he had completely recovered.

In 30 years of practice, this is the first actively developing case of malignant edema that I have had recover. I think the oxygen did the trick, but until I can get more data upon the subject, will continue to use the analine dyes in conjunction with it. I would be pleased to hear from fellow practitioners who try the treatment.

Roachdale, Ind. C. E. CALL.

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GOOD BUSINESS METHODS ESSENTIAL TO SUCCESSFUL VETERINARY PRACTICE

As veterinary medicine is not a philanthropy; business methods must govern its operation. The practitioner's right to a profit must rest upon a service rendered in a truly business and professional way. Sound business is based upon sound practices. Costs, inclusive of all overhead involved, are regularly determined for the purpose of establishing the basis for the reasonable profit that a given business venture merits. Material differences in the selling price of various commodities of like character, is generally due to inferior quality of merchandise or to the perverseness of irresponsible manufacturers or dealers, who operating upon the verge of insolvency, constitute a menace to all sound business.

Price cutting is not good merchandising, nor is professional fee cutting to the credit or ultimate profit of him who indulges in it. It is desirable that the practitioner through the medium of his local professional association, should reach an understanding as to reasonable fees for various phases of practice, to the end that the prestige of the profession may be rehabilitated in all localities where loose professional practices or unfair or illegal competition have impaired it.—*N. F. Williams.*

CATTLE POISONED ON SWEET CLOVER PASTURE

On June 9th, I was called by a client who reported one of his cows showing peculiar symptoms. Upon arriving at the farm, I found the following conditions. The cattle had been running in a 40-acre pasture for the past year, without any symptoms of disease. Upon turning them into an adjoining 10-acre field, in which there was some sweet clover, the following symptoms developed within eight to twelve days.

Temperature, 102°F., fast, labored breathing, grinding of the teeth, excessive salivation, tongue protruding, amaurosis, unsteady gait, walking in circles, a black, hemorrhagic discharge from the bowel, slight epistaxis, marked nervousness with her head constantly shaking up and down. This animal had been sick 10 to 16 hours prior to my arrival, and died within three hours after I got there.

No diagnosis or treatment was made at that time. The next day, three more animals on the same farm showed symptoms of black hemorrhagic bowel movements, resembling decomposed blood. Otherwise, they were normal. These three animals all died within the next three days, after developing symptoms similar to those described above.

Autopsies were held on two of these and the following conditions were found: Well marked hemorrhages in the intestinal tract, slight hemorrhage in the lung capillaries, and upon cutting an artery the liquid portion of the blood was thin and watery and the corpuscles were coagulated in clumps; the remainder of the viscera appeared normal except the blood. On different groups of superficial muscles, the capillaries seemed to be broken down and damaged, as if from local swelling.

I knew of no treatment, except removal of the cattle from the pasture or cutting the sweet clover. The latter plan was adopted. No more animals became affected. Therefore, I am inclined to a diagnosis of sweet clover disease. It is realized, of course, that these are not the usual symptoms or lesions of sweet clover disease, but the most careful search of the premises failed to disclose any lead or arsenic or other source of metallic poisoning or any poisonous plants. The remainder of the herd has continued on the pasture and there have been no recurrences of the ailment since the sweet clover was mown.

If anyone can support my diagnosis or improve upon it and advise a treatment, I will appreciate it very much.

B. H. Sisk,

Lawrenceville, Ill.

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ALL BULLS ARE DANGEROUS

The recent news that an Iowa veterinarian suffered a fractured pelvis from an attack by a bull, and must remain in the hospital for several months, recalls an incident that happened to me a few days ago.

I am a senior in one of the veterinary colleges and have been taught, as I suppose is taught at all schools, that the bull, particularly the bull of any of the dairy breeds, is the most dangerous animal in North America, and that he is responsible for a greater loss of life than any other species of animals in this country, not excepting poisonous reptiles.

I have noted frequently that farmers seem to have no appreciation of this fact and handle their bulls as if they were as harmless as the family mare.

I have spent my vacations during recent year's at a boy's camp. Recently I discovered a mature Guernsey bull stamping, pawing and bellowing in the camp ground, not a hundred yards from where 20 boys were playing. Three men came and drove him away. On my remonstrating with them about permitting the bull to be at large, the reply was: "He didn't charge anybody, did he? He's as gentle as a lamb." And, I suppose this bull will continue to bear a reputation of being "as gentle as a lamb" until he comes back and kills some of my charges or some other innocent persons. Statements as to the gentleness of bulls are based upon the past conduct of the individual and are not dependable as history has amply shown.

John E. Craige.

Lincoln, Pennsylvania.

Physiological, Pathological and Toxicological Effect of Snake Bites on Domesticated Animals*

By J. K. MacNAMEE,
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The United States Department of Agriculture[1] reports that each year from 1000 to 1500 persons in the United States are bitten by venomous snakes. There are no statistics of the mortality of livestock due to poisonous reptiles. Since there are no pathognomic symptoms of snake bite, the average person cannot make an accurate diagnosis of such cases and therefore any estimate of the annual loss of domestic animals from this cause is difficult to make; however, it must be considerable, since animals are exposed far more than persons to the attack of venomous reptiles.

Classification of Poisonous Reptiles

The poisonous snakes of North America may be placed in two main classes:

1. The Elapidae or harlequin snake (*Mucurus euryxanthus*) found in the southern part of the United States. Its venom possesses a neurotoxic action.

2. The Crotalidae. This class is found throughout temperate and tropical America. It includes the rattlesnake (*Crotalus* spp. and *Sistrurus* sp.), and cottonmouth water moccasin (*Agkistroden piscivorus*), and copperhead (*Agkistroden mokasen*). Their venom is hemotoxic in nature.

Venomous Apparatus

The venom of the poisonous snakes is injected into its victim by means of specialized teeth on the maxilla. The teeth or fangs are grooved from base to apex and are normally held against the roof of the mouth by a fold of mucous membrane. The snake apparently has perfect control over its fangs, raising or depressing them at will. Introduction of venom is accomplished by the action of several muscles which open the mouth, erect the fangs and compress the venom secretory ducts, thus forcing the fluid through the ducts of the fangs into the flesh of the victim. This entire action is the work of but an instant.

[1] Bi-571, Poisonous Snakes of the United States.

* Portions of a thesis submitted, in partial fulfillment of requirements for the degree D. V. M., to the Alabama Polytechnic Institute.

Composition of Venom

Venom is a secretion of the supra-labial gland that resembles, in its development, the parotid gland in mammals. It is a viscid liquid, usually yellow, which dries rapidly on exposure to air. The solid matter constitutes from ¼ to ⅓ of the fresh venom; when dried, it retains its poisonous properties for years.

Chemically, venom is highly complex, containing from 50-70% of protein, and 30% of mucous, fatty-matter, saprolytic microörganism, abraded epithelial cells, salts such as chlorine, phosphates of calcium, magnesium and ammonium, and poisons of protein nature.

Action of Venom

The actions of venoms on the animal body are very complex and vary greatly, probably owing to the difference in the proportions of the several poisonous substances which they contain.

Among the most important observable actions of the rattlesnake venoms are the effects on the local tissues, on the blood, and on the distant organs and tissues to which the venoms are carried by the lymph and blood streams.

The local effects are due to a toxalbumin which causes severe local pain and exercises a peculiar action on the walls of the blood vessels, causing them to become permeable and resulting in edema and localized hemorrhage. This leads to the well-known swelling and discoloration of the tissues near the bite.

The action of the harlequin or coral snake (*Mucurus euryxanthus*), venom is chiefly neurotoxic in action. It has a destructive effect on the nervous system. The most striking symptoms are paralytic. The lesions include those of neuritis of the small nerves of the fore and hind legs and degenerative changes of both sensory and motor cells of the spinal cord, particularly in the

lumbar portion of the cord. Changes occur also in the cells of the medulla oblongata. Paralysis begins in the fore legs of the animal, extends to the hind legs, and finally to the diaphragmatic muscle causing cessation of respiration and death.

The action of the venom of the Crotalidae group is chiefly hemotoxic and for this reason affects the fibrin of the blood and the erythrocytic cells. It is interesting to note that large amounts of venom destroy the clotting power of the blood while small amounts enhance it. It is owing to this peculiarity that the human medical profession is finding a valuable therapeutic use for this venom.

The erythrocytes are dissolved by the venom, the degree of hemolysis varying markedly with the type. The leucocytes are affected to a lesser degree. The changes in the blood and blood vessels lead to hemorrhages in the various parts of the body. The poisonous principal, causing this change, is known as hemorrhagin. Hemorrhage is very common from the nose and eyes and, in emaciated animals, may occur throughout the body.

The functional cells of various organs are destroyed by this poison. The kidneys are markedly affected; the secretory cells being injured, resulting in albuminuria. The urine is often stained red by hemoglobin and the blood vessels dilated by altered blood. Fatty degenerative changes occur in the liver due to the lipolytic enzyme, and a yellow discoloration of the conjunctivae, resulting from mild jaundice, is common in severe cases, in which death does not occur soon after the strike.

The proteolytic enzyme of the venom softens the muscular tissue. The diastatic enzyme activates the inactive pancreatic juice, enabling it to attack albuminoids.

Procedure

The snakes used in this experiment comprised:

Western rattlesnake (*Crotalus atrox*) four specimens, each measuring three to five feet in length.

Water moccasin—cottonmouth (*Agkistrodon piscivorus*) two specimens, each measuring five feet in length.

Tropical moccasin—cantil (*Agkistrodon bilineatus*) two specimens, each measuring three to four feet in length.

Copperhead—highland moccasin—chunkhead—pilot snake (*Agkistrodon mokasen*) four specimens, each measuring three to four feet in length.

Coral snake—harlequin snake (*Micrurus fulvius*) two specimens, each measuring two feet in length.

Gila monster—beaded lizard (*Heloderma suspectum* and *H. horridum*) one specimen, measuring two feet six inches in length.

These snakes were purchased from reliable dealers and examined immediately upon arrival to determine if they were in perfect health, in order that the experiments might not be misleading due to the secondary invaders found so frequently in the mouth of reptiles. The principal organism found was that of *B. Welchii*, which is present in small numbers in the mouths of all reptiles. The very common *Bacillus fluorescens liquefaciens* which is the cause of mouth-rot or "canker" in captive snakes was also encountered. It was difficult to complete the experiments due to this invader but the snakes were examined frequently and those suffering from mouth-rot were destroyed.

The test animals used in this work were gathered chiefly from city pounds, only dogs and cats in apparent perfect health being used. Occasionally, one was used with a skin disturbance but no animal showing an abnormal temperature, pulse, respiration, or appetite, was used. To the best of our knowledge the animals had never before been exposed to poisonous snakes so that there was little possibility of an established tolerance to venom in any of them.

The larger portion of the experimental animals were exposed directly to the snakes; that is, the animal was restrained and its leg shaven. The snake was seized and brought in direct contact with the animal. The "strike" could be plainly seen, and, unless the fangs were seen to penetrate the hide and the two fang marks found on the animal, the case was not recorded.

No snake was permitted to strike oftener

than once every two weeks so that the maximum amount of venom might be excreted at each strike.

A minority of the animals were injected hypodermically, the quantity of venom being determined by taking the average percentage of cubic centimeters excreted by that specie of reptile as computed by Dr. Afranio do Amaral (1928).

The average animal shows very little reaction to the presence of a snake. In no case was any fear noted until after the bite was inflicted.

Symptoms of Snake Bite

In all cases, as soon as the strike was completed, the animal showed severe local pain and frequently profuse hemorrhage, as may be noted by examination of the case records [omitted]. There were signs of localized pain, edema, and necrosis of the tissue. This edema spread very rapidly to the adjoining tissue so that an entire extremity or other portion of the body was very greatly enlarged.

Profuse hemorrhage always accompanied the strike of a moccasin which it was difficult, if at all possible, to check. The blood seemed to permeate through the tissue due to the complete and rapid hemolytic action of the venom.

The symptoms, lesions and post-mortem findings were very marked but varied greatly with the size of animal, age, and the type of reptile, as shown by the case records [omitted].

Extraction of Venom

The venom was extracted from the snakes by the method advocated by the American Antivenin Institute. The venom is collected in a small sedimentation glass, over which is tightly stretched some rubberized cloth. It is held in a firm clamp attached to the table. The snake is seized close behind the head with the left hand. (For safety, the operator is seated and holds the snake's tail between his knees, for, as is well known, a snake cannot be securely held by the neck alone.) Holding the head of the snake in the left hand, the open mouth is placed so that the fangs may pierce the cloth cover, either voluntarily or upon being forced to do so by the operator. Once the fangs pierce the cloth, the forefinger of the left hand is placed on top of the snake's head so that the fangs may not become disengaged. With the thumb and the finger of the right hand the venom is squeezed from the glands. The glands should not be massaged enough to expel all the venom because this practice seems to destroy the functional activity of the gland. If the snake expels the venom of its own accord it is difficult to get much more by force.

The coral snake was observed to bite and retain its hold more often than not. It was also noted that when one fang pierced the cloth, and if the snake voluntarily expelled the venom, it came through that fang only and not the other which might also have been erected but failed to enter the cloth. Therefore, as the sac from which the venom is expelled is embedded in the masseter muscle, it may be assumed that when only one fang is engaged, the muscle on that side alone contracts.

Antivenin

It has long been known that the repeated injections of minute amounts of snake venom into animals leads to the production of antibodies capable of neutralizing the poisonous effects of the venoms.

In preparing antivenin for human and veterinary use, horses are injected subcutaneously with small amounts of a dilute solution of venom every few days; the dose slightly increased at each injection. The horses eventually reach a state of immunity in which they will stand very large does of venom, doses several hundred times as large as is required to kill a normal horse.

When the horses reach this stage of tolerance they are bled and the serum separated from the other blood constituents. This is concentrated to one-fifth the original volume for veterinary use.

The antivenin, prepared by injecting a horse with the venom of any species of snakes, will neutralize the poisonous action of all the different constituents of this venom, preventing both the general effects on the central nervous system and the local effects on the blood vessels and the surrounding tissues. This antivenin is also

effective against the venoms of snakes of closely related species but not against those of more distantly related species. Thus the serum extracted from a horse immune to the venom of the western diamond-back rattlesnake is also effective against the venoms of the other North American rattlesnakes and also against the venoms of the moccasin, copperhead and against any tropical snake of the same genus. The serum, however, is worthless against the venom of the harlequin snake.

Neither the venom nor the antivenin is effective when administered by mouth. Each develops its activity only when injected subcutaneously, intramuscularly, or intravenously. The severe local reaction set up after injection of antivenin into the tissues influences absorption, thus exact quantitative results are obtained only by the intravenous method.

Therapeutic Use of Venom

As has been stated venom, in small quantities, causes clotting of the blood. Rattlesnake venom is used in medical practice where a hemostatic effect is indicated. When a nervous sedative of long duration is required the venom of the harlequin snake may be used with advantage. Definite dosage has been worked out on each type of venom, and no danger whatsoever is encountered in its use.

The harlequin snake is the most toxic to animals; its venom being almost 100 per cent effective. In the "pit-viper" class the cottonmouth moccasin is most effective and then the rattlesnake. In all the experiments [omitted], no death from a bite of a copperhead was recorded, although this species is highly toxic to man.

Differential diagnosis in snake and spider bites can be made by examination of the wound and application of hot packs of weak solutions of potassium permanganate; when if the condition is due to spider venom, the swelling will decrease immediately. If the condition is due to a snake bite, the area will remain enlarged and decrease but very little during the first applications.

By recognition of the type of snake, correct diagnosis and proper treatment and rest, it may be said that the mortality due to snake bites will be very low.

Treatment for Snake-Bite

There are innumerable treatments for snake-bite. Throughout the ages, the literature has contained a record of as many different "cures" as the sands of the sea. It is unbelievable that man has used so many herbs and voodoo instrumentalities to expel the "evil spirits" injected into the body by the "serpents." They should not be condemned rashly. The psychological effect is great and the patient will be allowed to remain quiet if the owner believes that the treatment is beneficial.

There are but two effective treatments for the toxicity of snake-venom. One is free, local bleeding (induced by suction) soon after the strike and the other is the use of the antivenin.

Investigation carried out by leading medical authorities have proved that the most important part of the treatment of snake bite is the removal of the venom by suction. Many cases brought to the veterinarian do not justify the cost of antivenin and in such the suction method must be relied upon entirely. The most successful method of treatment is a combination of the two.

Suction method.—One should first apply a rubber tourniquet about two inches above the bitten part, between the bite and the body. It should be just tight enough to obstruct the superficial but not the deep circulation. The tourniquet must be loosened ½ minute every 10 minutes to prevent gangrene. An emergency tourniquet may be made from a shoestring, necktie or as necessity may dictate.

The wound should be cleaned with antiseptic solution and painted with tincture of iodine. If the bite is over a hairy portion of the body, the area should be shaved. A cross incision about ¼ inch long and ½ inch deep, preferably connecting the two fang marks should be made. If excessive bleeding results, control by pressure and make a new incision close by it.

It is difficult to "suck" the blood from the bite on an animal with one's mouth. A snake outfit (no. 2006) may be pur-

chased from the Becton-Dickinson Company at a very reasonable rate. This contains all necessary instruments, including two suction cups.

During the first hour very little lymph can be withdrawn. Within three or four hours, the area may become very swollen and a greater quantity of fluid may be removed.

The patient should be kept quiet for at least 48 to 72 hours and antivenin given, if the value of the animal justifies it. Excessive swellings may be reduced by application of hot water packs containing a weak solution of potassium permanganate. Contrary to popular belief the potassium permanganate has no beneficial effect in counteracting the venom. However, the gas bacillus, *B. Welchii,* is present in the mouths of all snakes and it has been found in the wounds of patients under treatment for snake bite. The application of this oxidizing antiseptic thus avoids a dangerous complication. A combined prophylactic injection against tetanus and *B. Welchii* may be given if the value of the animal warrants it.

The following precautions should be observed in treatment of snake bite in animals.

Do not exercise or excite the animal in any way.

Do not drench with strong coffee or alcohol in the early stages of the case. Circulation, increased by exercise or stimulants, serves to distribute the poison more rapidly throughout the body.

The tissues should not be injured by injecting potassium permanganate in strong solutions. It is of no value as an antidote.

Never depend upon snake bite "cures" or home remedies. They are of no value.

Do not cauterize the site of the bite with a hot iron, strong acids or other irritants, such methods are wholly futile against any agent that is in the circulating blood.

The best results are obtained by giving the treatment immediately and then allow the animal to rest quietly in a dark, cool place.

In cases exhibiting shock physiological salt solution given intravenously and blood transfusions are supplementary measures of life-saving value. Only in cases of weak, intermittent pulse, should caffeine, strychnine or other stimulants be given.

Never give stimulants in the early stages of snake bite.

Use of Antivenin

The use of antivenin is comparatively recent in snake bite. Veterinary antivenin is a sterile serum less concentrated than that used for man. In an emergency it may be safely used on human beings.

Anti-snake-bite serum is manufactured by the Antivenin Institute of America and dispensed through Sharpe and Dohme Biological Laboratories. The cost to veterinarians is $3.75 per 50cc vial.

In animals, the greatest exposure to snake bite occurs while grazing, or in the case of dogs, while hunting. In grazing-animals the bites are commonly inflicted on the muzzle, about the face, on the neck, and also on the extremities. In dogs almost any part of the body may be bitten. Bites on the muzzle, and about the head, are more serious than those on the extremities, due to the greater amount of vascularity of the tissues. In swine, bites on portions of the body covered by fat usually are not fatal, because of the slow absorption of the venom.

In large animals (cattle, mules, and horses) the venom does not usually produce death as quickly as in small animals or in human beings. In small animals, the bites are more rapidly fatal, necessitating the prompt injection of a double dose of antivenin.

Antivenin should be injected as soon as possible after the discovery of the bite. Snake venoms are usually slow in the acting and, if the antivenin can be administered within 12 to 48 hours after the bite, the chances of its being effective in large animals are good. In small animals such as dogs, cats, sheep and goats, the antivenin must be administered promptly after the bite to be most effective. The earlier the serum is used, the more completely effective it is, and the quicker the recovery from the ill effects of the venom.

Dosage.—The smaller the animal, the larger the dose of antivenin required. The initial dose for large animals, 50cc, should

be injected either subcutaneously or intravenously. Where there is reason to believe that an unusually large amount of poison was injected by the snake, or when the symptoms develop quickly and in severe form, or where the initial dose does not give the desired effect, one or more additional doses of 50cc should be injected within a few hours.

Small animals, particularly dogs and cats, should be given 100cc as the initial dose, administered at the earliest possible moment following the bite. If the symptoms are not promptly relieved, one or more additional doses should be administered without delay. Doses smaller than 50cc cannot be recommended. There is never any danger of overdosing.

Where the treatment is delayed the serum should be given intravenously.

* * * *

COOK PORK WELL TO PREVENT TRICHINOSIS

Reports received by the U. S. Department of Agriculture of several recent cases of illness and some deaths from trichinosis justify a repetition of the warning to cook pork thoroughly before serving. Trichinosis is caused by eating raw or insufficiently cooked pork which contains trichinellae. These parasites occur in hogs, which themselves suffer no apparent inconvenience. But the meat of such hogs, unless well cooked, constitutes a hazard to human health and life.

The assumption that pork which has passed inspection at a federally inspected establishment is safe even when eaten raw or undercooked is erroneous. There is no test that will show definitely whether the parasites that cause trichinosis are present in a sample of pork, except in some cases of severe infestation. Certain pork products that are customarily eaten without cooking in the home are given a special processing at federally inspected establishments, and are free from the live parasites. However, more than a third of the pork consumed in this country is uninspected and without these safeguards. Pork products of the kind that ordinarily are cooked in the home are not processed in meat-packing establishments, since thorough cooking is a complete safeguard.

Vitamin D may be a means of preventing death and providing relief in trichinosis, if further experiments by Prof. Wayne W. Wantland, Northwestern university zoologist, prove successful.

Doctor Wantland found that vitamin D in the form of irradiated ergosterol definnitely hastens the calcification of the trichinella cysts in the muscle fibers during the critical stage of trichinosis in rabbits.

Making use of the property of vitamin D to stimulate calcium absorption from the intestine and calcium deposition in the body, as is done in rickets, the zoologist has brought about calcification of cysts containing the parasitic larvae in from five to six weeks.

* * * *

On cattle slaughtered at the packing houses, the loss due to bruises aggregates $4,000,000 annually. Most of this loss could be prevented by careful handling.

* * * *

Twenty-seven states were represented in the recent second national goats' milk contest. A New York dairy won first prize.

* * * *

Adult ticks, put into bottles with no food, by F. C. Bishopp of the U. S. Department of Agriculture, are still alive after more than three years' starvation, indicating the difficulty of ridding areas of ticks by keeping their hosts off such areas.

* * * *

FARM SURPLUSES

Horses and mules declined in number from 25,748,000 in 1920 to 16,622,000 in 1935. The investment in farm implements and machines per crop acre increased from 4.06 to 9.14 from 1910 to 1930, and the average investment in animal power declined from $8.39 to $3.74 per crop acre during the same period. The automobile, truck, tractor and improved farm machinery replaced 10,000,000 horses and mules during the 20 years preceding 1930. From 30,000,000 to 45,000,000 acres of land required to produce horse feed were thus released for growing other crops. Result: An increase in nearly all other crops.

Enteritis in Swine*

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AFTER hog cholera, the ailments of swine, characterized by inflammation of the intestine, stand first as a handicap to a profitable swine industry and in the absence of anything like comprehensive statistics, we cannot be sure that this group of ailments is second in importance even to hog cholera. Not all or even a major part of the loss from enteritis is reflected in swine mortality statistics. Much of the economic loss results from a failure of the affected animals to make proper gains from the feed consumed and from an increased incidence and severity of certain infections and parasitisms due to a lowering of the resistance of the victim of enteritis. The problem of swine enteritis thus concerns, in a large way, not only veterinarians and swine growers, but corn raisers, the packing and retail meat industries and the consumers of pork throughout the nation. It is worthy of careful study and merits our best efforts at control and prevention.

The enterites of swine are increasing in prevalence, in number and probably in severity. Their importance has been greatly enhanced within a score of years. The seriousness of enteritis in swine is not difficult to understand. The digestive apparatus of the domestic hog probably differs little from that of this animal before the days of domestication. The diet of the wild hog was extremely varied and included materials from both animal and plant sources — worms, larvae, cocoons, grubs, eggs, small mammals, crustaceans, carcasses of animals, seeds, tubers, fruit, bark, grasses, weeds and other plants—obtained as a result of much travel and rooting, which provided abundant exercise. Three or four years were required for maturity and excessive fat did not occur.

Probably in no other animal has domestication brought such radical change. The diet of the domestic hog is usually extremely restricted in variety, highly concentrated and enormous in quantity. Exercise is almost eliminated and selective breeding has induced a growth in a period of six months that formerly required half that many years. It would seem that under the circumstances, a near breakdown of the digestive system was inevitable and that is just about what has occurred in many instances.

Superinduced upon the foregoing preparation of the field for prolific disease culture, the conditions under which swine are maintained and their feeding habits, provide unfailing opportunity for attack upon the intestinal canal by all viruses, bacteria and higher parasites in the surroundings in which swine are kept. Alimentary and biologic intoxication are inescapable under the circumstances. All of these factors must be kept in mind in undertaking the diagnosis, the treatment or the prevention of ailments involving the intestinal tract of swine.

The drouth of 1934 impressed upon veterinarians of the Corn Belt the importance of the nutritional factor in the incidence, severity and convalescence of diseases of swine. The unusually inadequate diet of swine during and following the drouth of 1934 revealed in a striking manner the effect of nutritional deficiencies that had not previously been evaluated at their true importance, as contributing factors in specific and non-specific infections and in parasitisms.

Enteritis in swine is set up in a properly prepared field by many immediate causes. It is convenient to discuss these various forms of the ailment under the following names: Coccidiosis or bloody diarrhea, spirochaetosis or black scour, vitamin A deficiency, swine dysentery, nodular disease and infectious necrotic enteritis.

* Notes from an address at the annual meeting of the Indiana Veterinary Medical Association, Indianapolis, January 21-23, 1935.

Coccidiosis—Bloody Diarrhea

Bloody diarrhea, of course, is a symptom of intense inflammation of the large intestine. It occurs in various types of enteritis. However, although lacking in preciseness, the term has come to be used rather generally for that type of enteritis caused by infestation by protozoan parasites of the *Eimeria* spp.

Diagnosis.—There is no certain means of diagnosing coccidiosis of swine, except by finding the coccidia under the microscope; although the type of diarrhea and the history may enable one to make a tentative diagnosis with considerable assurance.

Treatment.—I think we must agree that we cannot do anything to destroy coccidia organisms in the infected animal. Any agent capable of doing that would destroy also the intestine. Coccidiosis is more common in poultry than it is in swine, although there is plenty of it in the latter animal in the Missouri Valley country, particularly in South Dakota, eastern Nebraska and Iowa. We hear of many kinds of treatment in poultry. Perhaps potassium dichromate in the drinking water is the most popular, yet in the laboratory we use a 5% solution of potassium dichromate in which to culture coccidia. In it they will develop their different stages. The impracticability of bringing about even a 5% solution of potassium dichromate in the intestinal contents of swine is obvious. So it is with other agents reputed to destroy coccidia.

Coccidiosis is a self-limiting disease and if, by good sanitation, reinfestation of the affected animal is prevented, or held down to a minimum, spontaneous recovery occurs in animals not already mortally affected. Treatment therefore consists in good sanitation to prevent, as far as may be, reinfestation, supportive measures and protection of the diseased intestine from secondary infection.

It should be noted that coccidia persist on the premises for a considerable period and new animals brought onto such premises develop the disease promptly.

Spirochaetosis—Black Scour

This condition, like coccidiosis, is characterized by hemorrhagic diarrhea, but in spirochaetosis the feces are darker than in coccidiosis and contain a great deal of mucus, hence the name black scour. Like coccidiosis, microscopic examination is necessary for a definite diagnosis.

The condition is common in swine in Iowa and exists elsewhere. It was first recognized as a pathological condition at Iowa City, although for a long time we have been finding spirochaetes in the digestive tract of swine. Formerly they were passed up as of no significance, but when we find a pig with the intestinal contents, particularly the contents of the small intestine, literally teeming with spirochaetes and no other organisms of pathological significance present, we are justified in basing our diagnosis upon this finding. There is a marked tendency to ulceration of the intestinal mucosa in spirochaetosis and always a great deal of mucus present.

Treatment.—Arsenic seems to be a specific for spirochaetosis in swine. Fowler's solution, two drams daily per 100 pounds live weight, administered in the feed, is very effective. In addition to this, some veterinarians use an alkaline solution and various supportive measures. However, when the diagnosis of spirochaetosis is made, the Fowler's solution should never be omitted from the treatment prescribed.

In this connection, perhaps it is well to state that I do not believe we have been using arsenic as much as we should in the treatment of diseases of swine. It has a distinct usefulness in quite a number of conditions in addition to being practically a specific in spirochaetosis.

Vitamin A Deficiency

Following the drouth in 1934, we had many cases of diarrhea in swine in eastern Nebraska and Iowa, and throughout the section where the feed was poor, that proved unyielding to any sort of treatment until some veterinarians, because of the similarity to the intense bloody diarrhea that occurs in dogs and cats from lack of vitamin A, used cod liver oil or sardine

oil or some product of that nature in an experimental way. These cases of bloody diarrhea in swine responded immediately to the administration of these fish oils without other treatment, and it seems reasonable to conclude that the pathological condition is essentially a break-down of the defensive properties of the mucous membrane of the intestine due to a lack of vitamin A in the diet.

The cod liver oil or sardine oil is administered at the rate of one pound to 50 pigs of an average weight of 75 pounds. In some cases, the animals eat the cod liver oil on the feed without objection; others refuse to eat it. In such cases, the objection of the pigs can be easily overcome by cleaning out their old bedding and supplying them with new bedding, which is sprayed with a light coat of the fish oil. When the pig uses the new bedding and gets his coat thoroughly impregnated with the smell of cod liver oil, he will no longer pay any attention to it in the feed. Many cases of bloody diarrhea have been encountered where the cause was not determined. The treatment of such cases has been variable.

Swine Dysentery

Another of the diarrheas or enterites of swine, is commonly known as swine dysentery. The name describes the principal symptom. It is essentially a balantidiasis due to one of the protozoa that is a common- we usually say a normal—inhabitant of the intestinal tract of swine and of man. Like the spirochaetes, the balantidia were formerly considered of no pathological significance, but in recent years we have learned that this parasite may assume a rôle of great significance. Under certain conditions, it is responsible not only for much loss of condition, but for a heavy death loss in swine.

The incubation period is from 10 to 14 days. Animals of all ages are affected, but the heavier hogs are more severely affected than the lighter and those just about ready to go to market, worst of all.

The course of the disease is rapid. The owner will notice a few of them sick one day; by the following day there will be a marked depression, the animals refusing all feed and having a disinclination to move. The temperature is not constant; some will have a high temperature, others will show no elevation. Naturally, they are rapidly depleted by the dysentery and soon become very weak, when they will show thumps. Thumping is usually thought of as a symptom of lung involvement, but it is not in this case. Toxemia will produce thumping as certainly as pulmonary ascariasis. The extreme weakness progresses to death in 24 to 48 hours. Not all of the animals die, but a big percentage of them do. The mortality is high.

The lesions are confined to the large intestine, although the cecum may not be involved. They begin at the cecal valve and extend posterially. The content of the bowl is fluid and the mucous membrane shows a high degree of irritation due to the fact that the parasites burrow into it. The lesions are more pronounced on the summit of the folds than in the creases, and thus when an intestine is stretched out, the inner surface is blotched with red.

Animals that recover remain carriers of the parasite for a long period and are apt to infect pigs the following year. What it is that enables this ordinarily harmless parasite to take on pathogenic properties for a healthy hog is unknown.

Treatment.—The treatment of balantidiasis in swine is unsatisfactory. Ordinary alkali solutions do a lot of good in some cases; others seem not to be benefited by alkalis. When the condition first began to be a problem in Iowa, some veterinarians had excellent results from the use of mercury and came to look upon it as a sort of specific for this condition; but it isn't dependable. Sometimes it fails to do any good at all. A buttermilk ration is always beneficial.

Much of the damage that is done to the intestinal mucosa is the result of secondary infections that develop in the burrows of the parasite. For these bacterial infections, bacterins are excellent and their use seems justified in all cases. However, of course, they have no effect upon the para-

site. Good sanitation is important; good hygiene essential; supportive measures are indicated.

Nodular Disease

There is a parasitic infestation of the intestine of swine that is common in the Missouri Valley country and rather rapidly extending over the swine belt. I refer to nodular disease, due to the larval form of the *Oesophagostomum dentatum*. This adult parasite is about three-fourths of an inch long. The larvae are found in the submucosa of the large intestine. In heavy infestations, they occur in countless millions. They may be seen by carefully examining the mucosa of the large intestine where numerous little spots, no larger than a pin head and of a differing color from the normal mucosa, may be detected. The spots are, in reality, mucous plugs filling the openings made by the parasite in burrowing through the membrane. These plugs can be easily squeezed out by pinching.

The animal seems to be but slightly damaged even by heavy infestations of nodular worms and there are no symptoms by which the condition may be diagnosed in the living animal. However, when the animals resistance is lowered by an inadequate ration, bad sanitation or poor hygiene, these perforations of the mucous membrane may serve as foci for secondary infections that may set up an acute enteritis.

Treatment.—There is no medicinal or biologic agent that can reach the larval form of the parasite buried, as it is, in the submucosa and protected by the mucous plugs. Control of the condition is purely sanitary.

Infectious Necrotic Enteritis

This is the oldest, or at least was the first recognized, intestinal disease of swine in this country. It was causing heavy losses at least a hundred years ago, and was, for a long time, confused with hog cholera.

The conditions under which it occurs are extremely variable. It most frequently attacks pigs weighing 30 to 50 pounds, and bad hygiene, bad sanitation and poor nutrition are regarded as factors contributing to its prevalence and severity. However, it may occur in swine of all ages from recently farrowed pigs to aged hogs, and it sometimes attacks thrifty herds maintained under good sanitation.

Climatic conditions seem not to influence the disease.

Etiology.—Although a large number of organisms are involved in necrotic enteritis and particularly the *Actinomyces necrophorus,* which was once thought to be the cause of the ailment, there seems little doubt that the primary cause is the *B. suipestifer.* Intestinal parasites, insanitary surroundings and an unsuitable ration are no doubt predisposing causes and as is well known, hog cholera virus (used in vaccination) is capable of transposing a latent infection into an acute and disastrous outbreak. The symptoms and lesions are too well known to need description.

Diagnosis.—Diagnosis is confirmed by autopsies of one or more cadavers, or animals sacrificed for the purpose. Finding the characteristic necrotic inflammation of the intestinal mucosa to which the exudate is adherent, together with a history of irregular appetite, diarrhea, dullness and a variable temperature confirm the diagnosis.

Prevention and Treatment.—Good sanitation and prompt isolation and rigid quarantine of affected animals are valuable measures for stopping the spread of the disease. The affected animals should be given alkaline slops of good quality. Bacterins are of value against the suipestifer organism, and possibly also against the secondary mixed infection.

Conclusion

In conclusion it may not be amiss to reiterate that in handling enteritis of swine, the veterinarian must keep in mind the basic stresses and hazards to which the digestive system of the modern hog has been subjected by domestication, and the special susceptibility that may be induced by a diet often, one may say almost routinely deficient in a varied assortment of essential elements. It is only when these contributing factors are properly evaluated that the veterinarian is likely to achieve material success in combatting the immediate causes of the various enterites in swine.

Disinfection of Poultry Yards

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SOIL disinfection as an essential part of poultry sanitation previously has been considered and discarded as impracticable. The large areas of many pens, the great volume and particulate nature of the soil, together with the presence of excessive amounts of organic matter, especially in soils which have been subjected to heavy contamination with fecal material, have made the disinfection of soils so difficult as to be infeasible with the disinfectants which have been considered. Reliance, very properly, has been placed upon rotation of yards with the contaminated areas being plowed and sowed to some cultivated crop. The results obtained have been uniformly good, as should be expected since the following disinfecting agencies have been combined:

1. Mechanical removal of the infective organisms beyond reasonable expectancy of contact with susceptible individuals. The fact that certain pathogens are motile has no significance in this connection as burial four or five inches beneath the surface amounts to nearly 100,000 times the length of these organisms.

2. Dilution. The comparatively few pathogenic microörganisms which are not turned under during the process of plowing but which are mixed with the soil, are so dispersed that there is little possibility of their causing infection.

3. Antibiosis. The struggle for existence in the soil is acute, and it is exceedingly unlikely that any of the organisms pathogenic for poultry other than perhaps certain fungi which are more adapted for saprophytic than parasitic existence could successfully compete with the normal soil organisms for food. Moreover, as was shown by Frost[1] in 1904, many of these soil organisms produce substances which are lethal to other bacteria. The soil protozoa, which feed largely upon bacteria, also assist in reducing the number of viable organisms. Contamination, therefore, remains on the surface where the normal antibiotic agencies are less active rather than within the depth of the soil.

4. Time. In an environment where multiplication is exceedingly unlikely, the majority of the pathogenic inhabitants will perish within a relatively short period.[2]

THE occasional failure of the soil to purify itself following plowing and cropping of yards, usually, may be attributed to:

1. The heavily contaminated areas adjacent to the house, along the fences and in corners, are almost impossible to plow and frequently are neglected.

2. Recontamination of the area. This may result from stray fowls gaining access to the plot, by winds blowing the droppings from occupied pens, and from materials carried by drainage water during rains.

Rotation Not Always Attainable

It is unfortunate that under the conditions prevailing on many poultry farms, the ideal of rotation with plowing and cultivation is unattainable. The presence of permanent buildings with inadequate areas for rotation and the high cost of land in certain sections have deprived many poultrymen of the very obvious advantages to be derived from the use of alternate runs. Unfortunately, no entirely satisfactory alternative has been offered and the continued use of highly contaminated soil has resulted. The writer is of the opinion that this presents a problem which is real and definite.

The common practice of expending time and money on the disinfection of poultry houses, yet allowing the fowls almost immediate contact with heavily contaminated areas in the pens is irrational. A study was made, therefore, of the degree of disinfection necessary to render the pens noninfective and the possible ways in which the surface of the soil could be disinfected.

CURIOUSLY enough, other branches of agriculture have not considered soil disinfection as unattainable or even as impracticable, and the disinfection of the soil used as seed beds is an established procedure in raising many crops. Tobacco seed beds are treated with steam which usually is supplied by a portable steam engine. Bitting (1920) found the application of acetic acid, in concentrations which were economically practicable, killed *Penicillium expansum, Alternaria solani* and *Oidium lactis.* His results were confirmed by Wolf and Shunk[3] (1921) and by Doran[4] (1932). Formaldehyde also has been used successfully in the disinfection of soils, although it is probable that the action is more bacteriostatic than bactericidal. It should be remembered that in the disinfection of seed beds, the choice of disinfectants is limited to those which do not hinder the germination of seeds planted soon after the application of the disinfectant. No such limitations are encountered in the disinfection of poultry yards, although permanent infertility would be objectionable, as it may be desirable to use these areas later for cultivation. Moreover, the disinfectant used must leave the surface non-irritant and non-toxic to fowl.

Heat Disinfection Impracticable

It is well recognized that exposure to dry heat must be intense and prolonged before bacteria are killed. As has been shown by Stafseth and Camargo[5] (1935), the flame guns which have been advocated for the disinfection of poultry houses possess but little merit and the disinfection of even clean cement floors is accomplished with difficulty by flaming.

It is entirely probable that steam sterilization of the upper layer of contaminated soil could be carried out, although the cost would be excessive as special equipment would be necessary.

Lye Disinfection Possible

The results obtained by Olitsky, Traum and Schoening[6] (1928) (who found sodium hydroxide effective in destroying the virus of foot-and-mouth disease in the presence of urine, manure and earth) and Tilley and Schaffer[7] (1931) (who reported the killing of *Pasteurella avicida* in the presence of 20% chicken manure in ten minutes by a 1:300 dilution) indicated the effectiveness of this chemical agent under adverse conditions. The efficacy of lye was further confirmed by the writer[8] who found a 1:150 dilution of household lye destroyed gram negative microörganisms in cow barns. None of the strains of *Brucella abortus* which were tested survived a 1:800 dilution of lye for as long as 10 minutes. Later data show that in the presence of a 25% suspension of human feces, *Eberthella typhi* was killed by a 1:1200 dilution[9] in 10 minutes and in the presence of a heavy suspension of chicken manure; *Salmonella pullorum* was killed by a 1:800 dilution in the same period of time.[10] Preliminary tests confirmed the belief that gram negative organisms in soil could be destroyed by the addition of reasonable quantities of lye solution. It was found also that the character of the soil and the amount of organic matter present did not alter the germicidal efficiency of a given degree of alkalinity, although they affected greatly the amount of lye which had to be added to attain the desired pH.

Experimental Procedure

As it is impossible to duplicate in the laboratory all of the conditions of poultry yard disinfection, the tests were conducted at several poultry farms in coöperation with the local veterinarians. Entire poultry yards were treated with lye solutions* of various strengths. At the end of 30 minutes, samples from the surface of the treated areas were removed with sterile spoons and placed in tubes containing sterile broth. This broth contained sufficient bromthymol blue to produce an easily recognizable tint when alkalinized, and had been acidulated to pH 5.5 by the addition of citric acid, which has been shown by Reid[11] (1932) to be the least toxic acid against *Escherichia coli.* In no instance was sufficient of the treated soil added to bring the indicator to the full alkaline color, showing that all of the alkali had been neutralized by the broth. After the addi-

* Lewis Lye containing 98% NaOH was used.

tion of the soil samples, the tubes were held at room temperature until transported to the laboratory for bacteriological examination.

Because of the impracticability of isolating pathogens from the soil, the destruction of the members of the colon aerogenes group was accepted to indicate disinfection. As has been shown by Tonney, Greer and Danforth[12] (1928), *E. coli* is one of the most resistant of the gram negative organisms and, with the exception of tuberculosis and the relatively rare staphylococci and streptococci infections of fowls, the majority of bacterial infections of fowls are due to gram negative organisms. Also the comparatively meager published data indicate that the filterable viruses are even more susceptible to the strong alkalies than is *E. coli*. Schalm and Beach[13] (1935) found the virus of infectious laryngotracheitis to be inactivated by 125 minutes' exposure to a 1:10,000 dilution of sodium hydroxide while a 1% solution was effective in one-half minute. The writer found the virus of fowl pox to be inactivated in ten minutes by 1:150 to 1:500 lye solutions, depending upon the amount of organic matter, the number of infective units in the inocula employed and the size of the particles of scab which contained the virus.

IN THE laboratory, subcultures were made from the broth containing the treated soil into nutrient broth containing 1:50,000 crystal violet. This was to inhibit the growth of gram positive organisms. After 48 hours' incubation, transfers were made into fermentation tubes containing 1:50,000 crystal violet broth to which 1% lactose had been added. At the end of 48 hours' incubation, these were examined for the presence of gas and gram stains made. Parallel tests with untreated soil were made in which the first broth was diluted 1:1000 before inoculation into the crystal violet broth. While it is reasonable to assume that a certain number of organisms of the colon-aerogenes group would have had to be present in order for them to initiate growth, yet the presence of growth in the control tubes in the absence of growth in the treated samples indicates a destruction of at least 99.9% of the members of this group of microörganisms.

The degree of alkalinity attained, in the laboratory, was estimated by the indicators acyl blue and parazo orange. In the field, trinitrobenzene solutions were found satisfactory. At pH 12 or above, which corresponds very closely to the degree of alkalinity necessary to kill gram negative organisms, trinitrobenzene solutions are a deep orange; at pH 11.5 or below they are colorless. When samples of heavily contaminated soil and lye solutions were mixed and cultures taken, the following results were obtained:

THE DISINFECTION OF HEAVILY CONTAMINATED SOIL WITH SODIUM HYDROXIDE

Proportion of Soil and Lye Solution	Reaction of Trinitrobenzene	Time of Exposure Minutes	Survival of Colon-Aerogenes Group
10 grams of Soil mixed with 5cc of 2% NaOH	Red-Orange	1	+
		5	+
		10	?
		20	0
		30	0
10 grams of Soil mixed with 10cc of 2% NaOH	Red-Orange	1	0
		5	0
		10	0
		20	0
		30	0
10 grams of Soil mixed with 5cc of 1% Lye Solution	Faint-Orange	1	+
		5	+
		10	+
		20	+
		30	+
10 grams of Soil mixed with 10cc of 1% Lye Solution	Orange	1	+
		5	+
		10	0
		20	0
		30	0

Field tests indicate that sufficient 1% lye solution to saturate the surface of the soil thoroughly results in a pH of 12 or above and the destruction of gram negative organisms. With this concentration the surface of the soil retains a germicidal degree of alkalinity for at least 30 minutes. In order to provide a greater factor of safety, concentrations of 1.5% are recommended. Soil treated with this concentration did not prove injurious to the feet of chickens when they were returned to the

pens an hour after treatment. The application of sufficient solution to saturate the surface of a poultry yard not only destroyed gram negative organisms on the surface, but maintained the necessary degree of alkalinity for a depth of at least one-eighth of an inch on packed surfaces and up to an inch in areas which had been loosened by scratching. The quantity required to saturate the surface of the soil depends entirely upon the character of the soil and the extent to which it has been packed. One yard, thirty feet square, was effectively treated with 50 gallons of solution. This was prepared by dissolving seven 13-ounce cans of lye, costing 10 cents each, in the 50 gallons of water. The cost of the materials, therefore, was 70 cents or 0.7 cent per square yard. The other extreme was reached in a yard which contained an excessive amount of organic matter and where the surface of the soil was not packed. Here, 50 gallons of the 1.5% solution saturated the surface of only 20 square yards and the cost was 3.5 cents per square yard. Perhaps neither of these figures will prove representative, and the average cost will be between one and two cents per square yard.

IN THOSE places where rotation cannot be practiced, the yards usually are comparatively small and may not exceed the floor space in the houses which usually is from three to four square feet per bird. The cost of the lye necessary for disinfection under such conditions is almost negligible.

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Effects of Sulphur on Coccidiosis in Chickens*

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MANY remedies have been suggested and tried in efforts to find one that would hold in check, or destroy, the protozoan parasite, *Eimeria tenella,* which causes cecal coccidiosis in chickens. The writers believe that they have found in sulphur an agent of much promise. At least, under the conditions of the experiments reported below, sulphur inhibited the development of the coccidia, impeded the formation of lesions, and prevented death from coccidiosis.

Experimental

The chickens used in the experiments were of three breeds, S. C. W. Leghorns, Barred Plymouth Rocks, and R. I. Reds. They were kept under conditions described by Herrick, Ott and Holmes (1936) and fed the Wisconsin No. 2 ration which consists of ground yellow corn (45%), standard wheat middlings (15%), pure wheat bran (15%), meat scraps (8%), dried skim milk (8%), alfalfa leaf meal (5%), limestone grit (1.5%), granite grit (1.5%), iodized stock salt (0.5%), and cod liver oil (0.5%).

The type of sulphur fed was ordinary flowers of sulphur. This was added to the dry mash and hopper fed. The coccidia employed to induce infection were from a pure line of *Eimeria tenella* and were administered into the crops of the chickens by means of a pipette. After the chickens were infected the feeding of sulphur was discontinued. The results of an experiment with 500 chickens in which sulphur was fed for a period of three weeks are presented in Table I.

IT is evident from the data in Table I that the effect of the coccidia was significantly reduced in those groups receiving sulphur. The effects of the sulphur were in general directly proportional to the amount administered, but even 1½% reduced the severity of the lesions and mortality to a considerable extent. The group receiving 1½% sulphur (10% once each week) were infected the day following the third feeding of the sulphur.

Attention is called to the fact that the chickens receiving sulphur made smaller gains than did the controls (See Table I). In the experiments reported here there was no attempt made to supply the digestible nutrients replaced by the added sulphur.

It was also noted that the cloacas of the chickens, especially those receiving 10 or even 5% were irritated. The significance of this observation has not yet been determined.

Since the sulphur was irritating when fed for as long as three weeks, larger amounts of sulphur were fed for shorter periods (2, 4 and 6 days) before infection. When fed for only two days before infection there was little if any effect of the sulphur on the coccidia. When, however, sulphur was administered for four days before infection was established its effect was marked. The mortality was 42, 22 and 19 per cent respectively for the controls and those receiving 10 and 20% sulphur. The results of feeding 10 and 20% sulphur for six days are shown in Table II.

It is obvious from these data that when 20% sulphur was fed for a period of six days there was a reduction in the severity of the lesions and no mortality from an infection of coccidiosis which was fatal to 70% of those that were not given sulphur. The feeding of 10% sulphur, although preventing visible lesions in one-third of those treated, did not prevent all mortality.

The effect of the sulphur on the rate of growth when fed for six days was insignificant. Those chicks which received 20% gained almost as much as the controls and there was no visible evidence of irritation in the cloaca. Further studies must, of course, be made before it can be said that

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the sulphur did not adversely affect the chickens.

When sulphur was fed from the time of infection with coccidia or after infection, it had little or no effect on the severity of the disease produced.

TABLE I

Effects of sulphur when fed to chickens from time of hatching until they were purposely infected at three weeks of age (500 animals)

Group	Per cent without lesions	Per cent severe lesions	Per cent mortality	% gain before infection
No sulphur.....	0	100	53	231.9
1½% (10% once weekly)	8	55	18	202.9
2%	7	53	11	149.6
5%	35	10	1	199.2
10%	57	4	2	135.7

TABLE II

Mortality and lesions in chickens fed sulphur for six days previous to infection with coccidia (93 animals)

Group	Per cent gain 6 days before infection	Severity of lesions Per cent —	++	++++	Per cent Mortality
No sulphur....	37.2	0	0	100	70.0
10% sulphur..	37.1	33.3	47.6	19.0	9.5
20% sulphur..	35.8	47.0	35.3	17.6	0

The question as to how long sulphur remains effective in the digestive tract, how it affects the coccidia and many other problems cannot be answered at this time.

Summary

Sulphur has been found to be effective not only in reducing but also in preventing the effects of coccidia on chickens, under experimental conditions. However, much work remains to be done before it can be recommended as a practical means of controlling coccidiosis. No evidence was adduced that the administration of sulphur has any curative effect on coccidiosis in poultry after the disease has become established.

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MODERNIZING AND EQUIPPING VETERINARY HOSPITALS

Pet owners everywhere applaud the tendency toward stricter sanitary conditions in veterinary hospitals and the inclination to hospitalize animals with the same degree of care employed in healing human ills. Veterinarians may be the first to admit this was not always so, but to them goes all the credit for establishing the higher standards of cleanliness, sanitation, and medical skill which prevail today in veterinary hospitals. But the point is what can be done to equip veterinary hospitals with the latest scientific appliances and to modernize the older establishments which, for want of adequate capital, have failed to keep abreast of new developments?

The modernization credit plan of the Federal Housing Administration provides a means of financing this type of work. The Federal Government does not lend money through the Housing Administration; but by a system of loan insurance, it provides a means of getting adequate credit from private financial institutions for remodeling hospitals and for the purchase and installation of eligible types of necessary equipment and facilities.

Veterinary hospitals, dependent on their credit standing, can borrow up to $50,000 for this purpose, repaying the loan in equal monthly installments over a period up to five years, at a low rate of interest.

Up to $50,000 may be expended under the Modernization Credit Plan on Class A types of buildings, which include hospitals, for structural repairs, alterations, and additions such, for example, as painting, wiring, plumbing and heating systems, air conditioning equipment, kennels, runs, etc.

A hospital may purchase and install with the proceeds of modernization credit involving in excess of $2,000 net and up to the permitted maximum of $50,000 net, eligible items of veterinary hospital equipment such as autoclaves, centrifuges, diagnostic machines (nonportable), fluoroscopes, horizontal and vertical (installed), hemoglobinometers, mercury lamps (nonportable), operating tables, sterilizers (electric or gas), transformers (current), ultra-

violet apparatus (nonportable), X-ray generators, X-ray tables, and X-Ray units (nonportable), etc.

These funds are generally available to borrowers of good credit standing everywhere. Application may be made to any bank (of which there are several thousand) approved by the Federal Housing Administration.

Under the Housing Act the lending institution cannot charge a higher rate of interest on these loans than 5%. This is simply a maximum interest rate beyond which lending institutions may not go. Many, however, have made and are making loans below the maximum rate.

Most of those informed on the subject predict a rise in construction costs in the near future. Now is the time to modernize facilities.

* * * *

A POINT ON ETHICS

A good deal has been written and said about ethics in medicine, both veterinary and human. We are all familiar with poor taste in advertising and the more apparent transgressions in professional ethics. It has recently occurred to this writer that the moral duties associated with the practice of human medicine are often just taken for granted or disregarded altogether in veterinary practice.

The tendency of a practitioner to become thoughtlessly calloused and methodical in his handling of animals is fostered by the exigencies of the times. One who handles many animals and is faced with the economic problems and responsibilities which have so marked the last few years is all too apt to become so engrossed with making a living, his personal affairs and the collection of bad accounts that he forgets his original motive in studying veterinary medicine, which, in most instances, was a sincere interest in the health and welfare of animals. Routine work tends to make one forget the means, and place all emphasis on the outcome of a given case. The practice of "treating the owner" should never be carried to where it is inimical to the animal. This seems a greater pitfall for veterinarians than for physicians, who are promptly reminded if they become callous in their attitude toward suffering.

Because an animal doesn't talk, the excuse may be made that they suffer less than human beings. Animals may lack their owners' highly developed imagination, but by a little reasoning one realizes that an animal—not able to analyze a situation and understand why he is treated in a certain way—may suffer more than the human who is gifted with cool logic. The child specialist and the veterinarian have a great deal in common here.

True, one must be practical; but this word should not be used to excuse inadequate anesthesia, dirty, uncomfortable pens, strong, ill-tasting medicines, improper ventilation and heat for hospitals, lack of fresh water, feed, awkward and unduly rough restraint of unruly patients or dull instruments, etc. In rural communities or districts where comfortable hospitalization may be impossible, proper instructions to the owner as to care, handling, etc., will usually take care of the case in a practical way.

One is aided much in retaining both the owner's viewpoint and his own professionalism by an active interest in his professional organizations, and the S. P. C. A.; by reading both the professional journals and some of the better pet and animal publications, and owning pets himself. Dr. John R. Mohler, Chief of the Bureau of Animal Industry of the U. S. Department of Agriculture, gave a very encouraging and interesting report on the more humane treatment of live stock at the 59th annual meeting of the American Humane Association at Washington (*Vet. Med. March* 1936).

Most important, one should never allow oneself to be guilty of charging fees insufficient to properly cover the cost of high class work. Surely a professional man, meeting all types of individuals, can cultivate the ability to explain and make clear to most, the importance of being humane to a defenseless animal, thus elevating not alone himself, but his profession, in the eyes of all.

W. H. LINDLEY,

Lawrenceburg, Ind.

Excess Vitamins Accelerate Development

By L. J. BROSEMER, Ottumwa, Iowa
Director Red Heart Experimental Kennels

ALEXANDER THE GREAT (who built a great and beautiful city and gave it the name of his favorite dog) sighed for more worlds to conquer, little dreaming that past the borders of his great empire lay a dozen "worlds" as large as his.

Anyone who thinks the peak of knowledge about dog feeding has been reached knows less about the science of nutrition than Alexander did about geography.

Alexander has been dead more than two thousand years, and in spite of continuous expansion by wars of conquest, scientific exploration and research for new trade outlets, there are still vast, mysterious, uncharted areas on the earth's surface.

Will it be another two thousand years before we know everything that goes on inside a dog? Possibly, but that's no reason why we shouldn't take advantage of every scrap of information we already have, and watch eagerly for the new and interesting and amazingly hopeful discoveries coming to light every year, every month—almost every day.

Just now the scientific world is examining recent experiments which promise to prove a point heretofore merely guessed at, namely, that by a super-abundance of vitamins in certain food mixtures (i.e., more than are needed to prevent symptoms of vitamin deficiency) we can produce—

1. Earlier development, greater reproductive power in both males and females;
2. Normal weight and better fleshing;
3. Higher degree of show bloom, more lustrous coat, a mellow feel to skin and hair;
4. Increased vigor and vitality;
5. Longer life.

A whole new race of "super-healthy" dogs? Perfection in details never dreamed of before? New records at every point where winners are determined? It is not altogether impossible. We have space here to glance at only two of the new and very significant developments pointing this way—two processes (appetite and digestion) and if it fails here, the subsequent cessation of growth, loss of nerve control (the disease of polyneuritis in dogs) and lowered resistance against infective germs are only indirect results.

But now it seems certain that this vitamin can exercise control over the *upward* rate of growth. In other words, not only is growth retarded by feeding less than enough of this vitamin, but by giving an extra amount, the rate can be speeded up beyond what heretofore has been considered normal.

STRANGELY enough, experiments on children led to the discovery of this fact of so great importance to dog feeders. Usually it is the other way around—facts learned from observing dogs are later adapted to human use. But here the animal nutritionist owes his knowledge to the human dietician.

Dr. Pearl Summerfeldt, able scientist in nutrition research, succeeded in obtaining a rate of gain of nearly five times the usual amount in feeding eleven children on a diet containing large quantities of vitamin B and extra supplies of other vitamins and minerals.

The daily administration of four ounces of a special food mixture in the diet of eleven children of approximately normal weight, over a period of ten weeks, resulted in a weight increase at 3.57 times the expected rate of gain.

A control group of ten children fed four ounces of ordinary cereals in the daily diet gained at 1.17 times the expected rate.

Who says there is no difference in *which* cereal grains, or *which part* of cereal grains are used in a diet? And it makes the same kind of a difference which meats, which sources of vegetable substances, and which

kind of every other source of nutrition goes into a dog's body!

For a second ten-week period, Doctor Summerfeldt reversed the groups, and the control group now received the special food mixture. The rate of gain of these children was 4.84 times the expected rate. The new control group, formerly on the special cereal mixture and now receiving ordinary cereals, gained at just the expected rate.

The diet Doctor Summerfeldt used, as anyone versed in the science of animal feeding understands, is far from being entirely suited to dogs. But practically the same essential elements may be combined in the same proportions and ingested by the dog from other sources.

With this new information concerning a notable increase in growth and weight merely by adding a few items to the diet, is it hard to believe a forecast of a new era in dog breeding by the thoroughgoing application of scientific methods of canine improvement?

It is already well established by actual experiments on animals that the use of a super-abundance of vitamin-rich foods produces a marked improvement in appearance, weight, vigor, reproductive power and life duration which might properly determine super-health.

But here is the way to a more definite unnderstanding of how and why and when the effects are produced. Possibly it will presage the discovery of a new series of potential functions all along the vitamin front!

NOR is this all. Here is the other remarkable discovery referred to, made by Dr. Siegfried Maurer of the University of Chicago. It involves the most fundamental difference between "man's best friend" and other domestic animals—his intelligence.

Doctor Maurer has definitely proved by a series of controlled tests on experimental animals that this food factor has a pronounced influence on ability to learn.

Animals given a good supply of vitamin B, Doctor Maurer found, learned their way through maze boxes twice as rapidly as those the diets of which contained less of this important element. In addition, his tests indicated that mental dullness is not 100% hereditary. Pups, the parents of which lacked sufficient vitamin B, attained normal intelligence when fed a diet rich in this element, although among them the infant mortality rate was higher than among offspring of normal parents.

The criticism is often made that dog breeders devote too much attention to physical points and not enough to mental development. There is a widespread belief among the general public that the average purebred dog has less capacity to learn or "brains" than the average mongrel.

Probably this criticism is not justified, but it is not unfair to ask whether the native intelligence of the average show specimen is equal to that of the wild dog in nature, obliged to live by his wits from puppyhood, but supplied, in compensation, with nature's own foods, possibly in wide variety. Anyway, it is not unreasonable to believe that in many large kennels the vitamin B factor is deficient in the diet.

ANOTHER point to remember is that vitamin B is not stored to any extent in the body. An occasional supply, therefore, meets only the need of the moment; this vitamin should be taken in by the dog every day to meet that day's requirements.

The effects of a shortage or absence of vitamin B in the ration are quick and decisive. If *all* the vitamin B is eliminated, a dog will starve to death, through loss of appetite, before any symptoms of neurotoxic troubles develop.

If a little vitamin B is given, the worst effect in the animal organism is polyneuritis. If a little more, but still not an adequate amount, is supplied, the result is retarded growth.

Dr. George R. Cowgill, internationally recognized authority, who has experimented with vitamin B requirements for ten years, says a dog will eat a ration adequate in everything but this element for a period of about three weeks. Then a definite lack of interest and refusal to eat the ration appears. If at this time the animal is given a sufficient amount of some source of this vitamin, the desire to eat is restored

and the animal eagerly snaps up the ration he previously spurned.

If a dog's appetite is not normal, if his body weight does not increase at the normal rate, or if there is evidence of spasms or of inflammation of the nerves, it *may* be because he isn't getting enough vitamin B.

It is necessary to make certain this vitamin actually reaches the dog. While it is not seriously impaired by cooking or baking at ordinary temperatures, unless the natural acidity of the food has been reduced by the addition of alkali, it dissolves readily in water, and often in home cooking much of it is lost when the cooking water is discarded. When liver is boiled in the open-pot way, for instance, it is very uncertain whether the dog will get from it, "full value" in amount of this vitamin.

Foods cooked in a pressure cooker, as used in home and commercial canning, being heated in their own juices in airtight containers, are in no danger of serious "water leakage" of the antineuritic element. Dr. E. V. McCollum says that commercially canned foods are little inferior to fresh (raw) articles in respect to their vitamin B content, since the period of processing is so short. And of course they are far superior to raw foods in respect to digestibility.

THE experiments we have recorded do not necessarily mean that the ultimate size of the animal given a full supply of vitamin B will be larger than normal, but it does indicate that the animal may be fully grown when he reaches the age at which growth stops, and may arrive at that quotient sooner. Also that he may reach his norm of intelligence—something most dogs, apparently, never do.

It has long been known that growth could be retarded (with permanent effects) by undernourishment. But what a find to learn that growth may be made to progress at a rate faster than that which has always been considered normal! And that *better than average* dogs can be raised by using nothing but the advantages supplied by scientific knowledge of nutrition!

There's no shortage of worlds, if we just have the vision to see them!

PARALYSIS OF THE POSTERIOR LIMBS OF A MULE COLT

February 3, 1936, a mule colt was presented to the veterinary clinic at Kansas State College, with the following history. That morning the caretaker had found the subject, a female mule colt, aged eight months, in a recumbent position and unable to rise or use the posterior limbs. The colt had apparently been in a good state of health previously. The ration consisted of corn, oats, and alfalfa hay. The colt had suffered from omphalophlebitis when a foal, but had made an uneventful recovery.

The temperature, respirations and pulse of the colt were found to be within the normal range. The visible mucous membranes were practically normal and the appetite was normal. A fecal examination revealed infestation with strongyles.

The animal was placed in a well-bedded, heated stall and given intravenously, 250cc. of calcium gluconate, 100cc. of glucose solution and 500cc. of normal mule serum.

The following day the animal remained in the standing position for about one hour, by the aid of slings and a chain hoist. On the third day, the hoist was attached to an overhead track and the animal assisted in walking. Internal medication up to and including the fifth day consisted of calcium gluconate, glucose, and normal mule serum. At this time a decided improvement was observed.

After the fifth day the previous line of medication was discontinued and replaced by the intravenous administration of a solution containing 100 grains of sodium cocodylate dissolved in 125cc. of sterile, distilled water. This solution was administered on alternate days. Active massage and forced walking was practiced daily.

At the end of three weeks the patient was able to arise and walk in a normal manner.

This experience illustrated the value of exercise in treating paralytic conditions, particularly those the exact nature and cause of which are unknown.

H. J. LINDENSTRUTH,
Manhattan, Kansas

Buccal Papillomata in Dogs

By L. A. MERILLAT, Chicago, Illinois
Haver-Glover Laboratories

IN AN article entitled "Cancer expérimental et Néoplasies expérimentales," Professor Charles Lombard of the Toulouse faculty writes the following interesting section* on buccal warts of dogs:

"It has been demonstrated that warts of the buccal cavity of dogs, cutaneous warts of the rabbit and cattle, and warts of the human being are caused by an ultravirus. One recalls in this connection that in 1919, Wile and Kingery proved that the filtrate of the human wart passing through the Chamberland filter will reproduce warts when reinoculated into a human subject. The period of incubation is four to eight weeks. The inoculation is particularly easy when made into the bleb of a superficial burn (Philibert).

"In regard to buccal warts of dogs, the disease is transmissible to pups in series, starting with filtrates passed through the Berkfeld filter (Findlay, 1930), but not to rabbits, cats, rats, mice, guinea pigs, and monkeys (De Monbreun and Goodpasture). The incubation period averages 30 to 33 days but can be as short as 10 days in sick or undernourished dogs. One attack confers permanent immunity.

"The virus has an affinity for the buccal mucous membrane. The filtrate of buccal warts inoculated into other regions (mucous or cutaneous) give negative results. The cells of the buccal mucosa present, histologically, inclusions analagous to the bodies of Lipschutz of human warts. Submitted to a temperature of 58°C. for an hour, the virus becomes avirulent. On the contrary, it can be preserved for a long time in a solution of salt and glycerine equal parts or by desiccation after congelation.

"It was in 1898 that Pemberthy wrote for the first time of an epizoötic of warts in the mouth of fox terrier pups. In a kennel of 40 only three escaped the contagion. M'Fadyean and Hobday succeeded in transmitting warts to other pups by scarifying the mucous membrane, but subcutaneous injections were without results.

"In the wild rabbit of the genus called cottontail (genus Syvilagus) in certain regions of Iowa and Kansas there exists an infectious papilloma or papillo-fibroma (papilloma of Shope) transmissible by filtrates as was demonstrated by Richard E. Shope. Inoculations of this filtrate intra-epidermically in wild or domestic rabbits reproduced the disease. Only the epidermal cells are sensitive to its action. Inoculations by any other route are negative.

"A notable fact is that when grafted under the skin, in muscles or viscera of a wild or domestic rabbit, the graft rapidly takes on the character of a malignant tumor. The virus inoculated into domestic rabbits produced papillomata, the most flourishing of which were transformed to spino-cellular epitheliomata (Peyton and Beard). Approaching these experimental facts are the observations of Syverton and Barry on a wild rabbit affected with four warts of which one spontaneously transformed into a malignant growth.

"Therefore, according to the conclusions of Peyton, Rous, and of Beard, it would appear that the virus that causes warts in rabbits should be considered as the initial cause of the cancers resulting from them. Observations and conclusions of extreme importance!

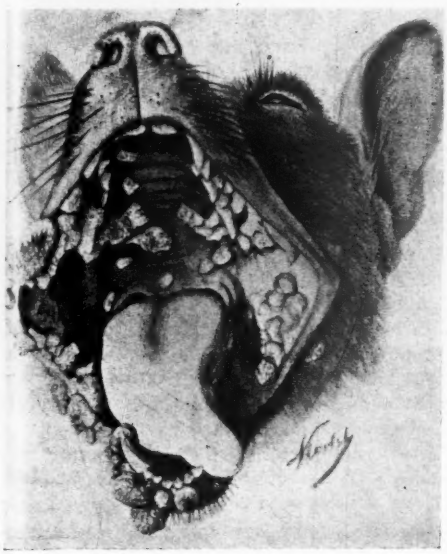
They recall new and numerous works. If they confirm these facts—without applying them to all tumors and to all animals—they fortify the virulent theory of cancer that Borrel has insisted upon for 32 years with constancy and fortitude.

"Only recently Peyton, Harde and Kobozieff obtained a positive inoculation in wild French rabbits (lapin de garenne) with fragments of warts conserved in glycerine sent to them by Shope. The tumors of these wild rabbits were successfully grafted into domestic French rabbits.

"In 1920, Magalhales succeeded in pro-

* Lombard, Prof. Charles. (1936) Experimental Cancer and Experimental Neoplasms (title translated): *Revue de Médecine Vétérinaire et Journal de Médecine Vétérinaire*, 88:6, pp. 305-346, June 1936.

voking a generalized papillomatosis in a bull by inoculating the filtrate of a spontaneous wart. The experimental work of C. T. Creech, in 1929, removed all doubt that wart filtrates passed through the Berkfeld filter are capable of reproducing warts on new animals inoculated. The test com-



PAPILLOMES BUCCAUX
From Rev. de Med. Vet. et Jour. de Med. Vet.

prised 22 different animals inoculated at the base of the ear, the lateral surface of the neck and in front of the shoulder, either by intradermal inoculation or by scarification. Seven of the inoculated subjects developed warts. The proof that warts are caused by an ultravirus is, therefore, confirmed. It is long since known that neoplastic tissue (of warts) is inoculable, not only in cattle but in man and that warts have been signalized as contagious. In particular, warts are transmitted naturally from cows to the lips and mouths of calves and accidentally to man. Inversely, the human wart can be transmitted to cattle."

* * * *

TRANSLATOR'S NOTE.—The purpose of this excerpt is merely that of reaffirming the infectious character of warts, not only those of the buccal cavity of dogs but also the cutaneous warts of wild and domestic animals and man. One is obligated to apologize to the author for not reprinting the entire 41-page, illustrated article on the general subject of transmissibility of experimental neoplasms written with the object of clarifying the etiology of tumors which, as the author declares "is the work of tomorrow."

* * * *

TREATMENT OF WARTS IN DOGS

Where warts occur singly, they may be tied off with suture material or rubber bands or snipped off with scissors or dissected out with the scalpel or cauterized with a hot iron or sloughed out with caustic applications as may be indicated in the individual case; but where they occur by the score or hundred or, as they do in some cases, by the thousand, such treatment is ineffective, not only because the number of warts makes such treatment difficult or impossible, but because the warts in such cases recur with great rapidity. A better plan is to administer arsenic internally in full medicinal doses. The disappearance of the warts is more prompt and certain from this treatment than from any other.

The usual time required for the disappearance of the warts under the arsenic treatment is one week. The Fowler's solution should be administered three times daily and some practitioners at the same time apply it to the warts. Sodium cacodylate is said to be as efficacious in the removal of warts as is Fowler's solution.—*H. C. Stephenson.*

* * * *

WHAT CITIES SPEND FOR HEALTH

Expenditures for health protective services in 1934 by the ninety-four cities of the nation with 100,000 or more people varied from 19c per capita in Oklahoma City to $2.63 in Newark. In general, the largest cities spent more per capita than the smaller ones in this group although there were several exceptions. Only three of the thirteen with upwards of 500,000 people spent less than $1.00 and these spent 70c, 80c, and 86c, respectively. None spent as much as $2 and the average was $1.31.

Abstracts

X-RAY THERAPY IN ACTINOMYCOSIS AND STREPTOTRICHOSIS

Examination of a four-year-old cat[103] revealed a firm tumor in the region of the mandible and in the upper left region of the neck, and various fistulous openings. The x-ray picture disclosed irregular periostal enlargements of the left mandible. No normal bone structure was visible. The right mandible was likewise broadened irregularly. There appeared an oval clearance in the bone structure around the foramen mandibulare. Microscopical examination showed actinomyces. Diagnosis: Actinomycotic osteitis rareficans; graular osteomyelitis; periostitis ossificans; secondary actinomycosis of the skin. The cat was given x-ray treatment three times in both lateral positions. Details of the x-ray formula and treatment are to be consulted in the original article. Six weeks later the swellings had vanished entirely, and after eight weeks the fistular ducts had also disappeared.

Eight dogs exhibited streptotrichosis in various regions of the body. They were given x-ray treatment. The exact details of the formula and of the treatment must be consulted in the original article. The wounds and the fistulous ducts healed during the pause following the first treatment. The treatment was repeated and resulted in complete healing. Similar good results were obtained from the x-ray treatment of cats suffering from streptotrichosis.

* * * *

ABORTION FROM NUTRITIONAL CAUSES

During the 1934 foaling season a breeding stable reported 28 abortions among 46 mares.[105] Twenty aborted during the latter part of March. Infection as a possible cause was eliminated by the investigation. With the exception of a tendency to constipation, the mares appeared healthy. The aborted fetuses exhibited hyperemia and necrotic areas in liver and kidneys, hemorrhages upon the serous membranes and aspiration of embryonic fluid into the lungs. This finding indicated intoxication of the fetus through the maternal blood. The cause of the toxin formation was found to have been the abnormal fermentation processes in the intestine, started by the constipation. In addition, it was found that the calcium and vitamin content of the blood was insufficient. The majority of the mares exhibited hypocalcemia.

* * * *

A NEWLY-DISCOVERED DISEASE OF CATS

During the past few years a new fatal epizootic among cats was observed in Germany.[106] The character of the disease is that of a diphtheroid laryngitis, tonsillitis and gastro-enteritis. The incubation period is seven to eight days. The duration of the disease is one-half to three days. The symptoms are weakness, vomiting, loss of appetite, fever, occasionally diarrhea. Death is preceded by coma.

The anatomical and histopathological changes consist in a laryngitis, sometimes catarrhal, sometimes diphtheroid in nature, a tonsillitis, sometimes catarrhal and sometimes diphtheroid in nature, and a gastro-enteritis, sometimes catarrhal and sometimes diphtheroid in nature.

Infectious gastro-enteritis (cat typhus) differs from the infectious laryngo-enteritis in the absence of lesions in the larynx and in the tonsils.

The intestinal form of cat distemper differs from the infectious laryngo-enteritis likewise in the absence of lesions in the larynx and in the tonsils.

Cat diphtheria (angina) differs from the infectious laryngo-enteritis in that there are no lesions in the intestines present in the former.

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[103] Pommer, A., 1936. Röntgentherapie der Hautkrankheiten bei Hunden und Katzen, XII Aktinomykose und Streptotrichose; (X-Ray Therapy of Actinomycosis and Streptotrichosis in Small Animals). *Wien. Tierärztl. Monatsschr.*, 23:2, pp. 36-44.

[105] Wall, S., 1935. Abortion in Mares due to Dietetic Errors, (Trans. title). *Skandinavisk Vet. Tidskr.*, 25:4, pp. 109-204.

[106] Krembs, J., and O. Seifried, 1936. Laryngo-Enteritis Infectiosa, eine in Deutschland bisher unbekannte Katzenseuche, (Infectious Laryngo-Enteritis in Cats); *Tierärztl. Rundsch.*, 42:20, pp. 277-80.

PRINCIPLES OF X-RAY THERAPY

Every living cell which has absorbed Roentgen rays undergoes a change.[107] The nuclei of the cells, and within the neuclei the chromatin, are the object of attack from the rays. Of greatest importance to the therapeutic effect is the depressing action of the rays. It manifests itself either as an inhibiting force, preventing function and growth, or as a degenerative and destructive force. The Roentgen rays obey the Arndt-Schultz biological law which states that weak stimuli have a stimulating action, intensifying the stimuli has a paralyzing action and very intense stimuli possess a destructive action.

A peculiarity of x-ray therapy consists in its delaying action upon cells. This characteristic is of practical importance in the calculation of the length of time intervals between repeated treatments. The sensitivity of the cells to x-rays differs, depending upon the developmental and nutritional stage of the nucleus. The selective sensitivity of individual cell types and tissues forms really the basis for the possibility of Roentgen ray therapy. A cell is the more sensitive, the more active its processes of metabolism. According to the degree of sensitivity the tissues are classified as hypersensitive, sensitive and hyposensitive. Young animals are more sensitive than older ones. The action of Roentgen rays may be increased artificially by causing a hyperemia of the tissue, or by feeding iodine or arsenic.

CAUSES OF SIDE-BONE

Ossificaton of the cartilage of the hoof[108] is brought about by the great body weight, angularity of the hoof with a flat sole, a wide hoof, the porous structure of the bone of the hoof, the lack of support for the branches of the hoof-bone, irregular position of the legs and uneven distribution of the load.

Travel upon paved roads and contussion play a minor rôle in the development of ossification. Disposition to this disease is not inherited, but merely the form of the hoof and its tendency to unfavorable position.

PROBLEMS OF PARASITISM IN HAWAII

The Hawaiian Islands have a special sort of tropical parasite problem.[110] The elevation of the Islands varies from sea-level to nearly 14,000 feet, the annual rain fall from 30 to 600 inches, the terrain from level to rugged and from swampy areas to unweathered lava. The factors influencing parasitism are those influencing parasitism in general: The presence of parasites to start with; the introduction of parasites; topography; temperature; moisture; sunlight; soil; flora; fauna (including intermediate hosts); farm practice; sanitation; general nutritional level of man and animals, and the economic-social level.

Parasites of Horses.—Ascarids, strongyles and bots occur in the horses. Under the circumscribed conditions afforded by relatively small and isolated islands, the use of known control measures for all of these parasites would probably be very effective. Flukes (*Fasciola hepatica*) probably occur in horses to some extent. It appears, however, the resistance of the horse to this parasite is so great that control measures are unnecessary.

Parasites of Cattle.—Fasciola hepatica infestation is prevalent. Ox warbles occur and strangely, have no such seasonal incidence as they have elsewhere. A skin disease caused by filiard worms (*Stephanofiliaria stilesi*) occurs on some of the islands.

Parasites of Sheep and Goats.—Fasciola hepatica and *Oestrus bovis* are said to be present in sheep in the islands. The writer had no opportunity to examine sheep. He believes that under the conditions obtaining in Hawaii, the eradication of liver flukes in sheep, goats and cattle would offer little difficulty.

[107] Pommer, A., 1934. Röentgen therapie der Hautkrankheiten bei Hunden und Katzen II Die biologische Wirkung der Röentgenstrahlen auf die Haut, (X-Ray Therapy of the Skin of Dogs and Cats); *Wien. Tierärztl. Monatsschr.*, 21:5, pp. 135-38.

[108] Volkmann, 1936. Die Ursachen der Verknöcherung der Hufknorpel, (Causes for the Ossification of the Cartilage of the Hoof); *Tierärztl. Rundschau*, 42:20, pp. 380-84.

[110] Hall, Maurice C., 1936. Problems of Parasitism in Hawaii; *Revista De Parasitologia, Clinica y Laboratorio*, 2:3, pp. 367-83.

Parasites of Poultry. — Coccidiosis is troublesome. Gizzard worms (*Cheilospirura hamulosa*) are a source of trouble. Parasites of the proventicula are common. The cecum worm (*Heterakis gallinae*) deserves attention and several species of tapeworm occur.

Parasites of Dogs.—Ascarids are common, both the *Toxocara* and the *Toxascaris* being present. Hookworms cause much disability and death. Whipworms are very common and tapeworms were observed. Heartworms (*Dirofilaria immitis*) are a serious problem and have been for many years. The external parasites of dogs include various species of ticks and fleas, of which the most important is the *Rhipicephalus sanguineus.*

Parasites in man are also discussed.

POULTRY DISEASE RESEARCH

III. The intestinal flora of chickens affected with enteritis associated with intestinal parasitism.

IV. The pathologic manifestations of the causal micro-organisms in the fowl.

Micro-organisms of the paratyphoid and typhoid groups were found in the intestinal tract of chickens affected with enteritis associated with coccidiosis, roundworms, tapeworms and capillaria infestations.[109] Eight species of the paratyphoid group and two of the typhoid group were found in 137 of 230 samples of intestinal contents from selected birds. *S. aertricke* was the more frequently isolated; *E. typhi* was isolated from two birds. Paratyphoid or typhoid organisms constituted from 8.7% to 61.4% of the intestinal flora at the site of greatest inflammation in 36 birds.

The conclusion was made that intestinal parasites interfere with the normal bacterial flora allowing these micro-organisms to become established in the intestinal tract.

The various pathologic manifestations induced by proper infection by certain members of the paratyphoid and typhoid groups of bacteria are classified. Hemocytoblastosis results shortly after infection from which the bird may recover or another manifestation develops. Among the latter are septicemia, "light," anemia, fowl paralysis, leukemia (three types), lymphomatosis, aleukemia or leukemic lymphocytoma and certain tymors. The interpretations of these manifestations as used in this study are described.

[109] Emmel, M. W., 1936. The etiology of fowl paralysis, leukemia and allied conditions in animals; Florida Agr. Exp. Sta. Bul., 293.

CONTROL OF STRONGYLE INFESTATION

Experiments[111] performed indoors and outdoors indicate that there is practically no vertical migration of horse strongyle larvae in clay soil.

Experiments made indoors and outdoors under shelter showed that extremely small percentages of buried larvae reach the surface of heavy sandy loam and sandy clay loam from depths of four to 5.5 inches in from about four to six weeks. During similar periods, 3.5% or more of buried larvae reached the surface of these soils from depths of one, two and two-and-one-half inches.

Deep plowing under of infested soil should be of some value for the control of strongyle parasitism in horses, but the efficacy of this control measure is subject to definite limitations, particularly in respect to the depth at which the larvae are buried by plowing and the type of soil in which they are present. Clay soil presents an almost complete barrier to the vertical movement of the larvae.

EARLIEST ATTEMPT TO ERADICATE BOVINE TUBERCULOSIS

Three essential steps[112] are now taken to eradicate bovine tuberculosis in Belgium, namely:—

1. Owners who possess tuberculosis-free herds can obtain a certificate to that effect from the government annually. To profit by this ruling, the herd is inspected at the owners' expense except that the tuberculin is furnished gratuitously by the government.

[111] Lucker, John T., 1936. Extent of Vertical Migration of Horse Strongyle Larvae in Soils of Different Types; *Journal of Agricultural Research,* 52:5, pp. 353-61.

[112] Van Giodsenhoven, Professor. La prophylaxie de la tuberculose bovine. *Annales de Médecine Vétérinaire,* 80:2, Jan. 1935.

2. Tuberculosis of cattle is a reportable disease including the non-clinical cases detected by the tuberculin test, provided the value exceeds 1,000 francs.

3. Animals imported into Belgium are submitted to the tuberculin test at the frontier and kept in quarantine for 10 days to carry out the inspection. Reactors or clinical cases are indelibly marked in the ear and returned to the country of origin or isolated and slaughtered within three days.

These principles have been in force since 1927, but, says the author, it is still impossible to state the effect of the program.

The author recounts the other procedures such as the methods of Bang and Ostertag and the resort to B.C.G., points out that Belgium was the first country to make a systematic effort to combat bovine tuberculosis, when in 1895 a decree was issued condemning for slaughter all clinical cases, clinical suspects and reactors to the tuberculin test, but this measure was modified when it was found that the plan would sacrifice ¼ of the cattle in Belgium.

* * * *

EXPERIMENTAL STUDIES ON LIVING SWINE ERYSIPELAS VACCINE

The bacillus of swine erysipelas cultivated in a media containing trypaflavine loses its virulence after 50 inoculations five days apart and it remains avirulent for hogs even in massive doses of 800cc of the culture.[113] This attenuated bacillus has high immunizing powers. Swine inoculated with 0.03cc, of the culture per kilo of body weight show a sufficient resistance to the disease and the presence of agglutinins in the blood. The vaccine is made by simply culturing the avirulent bacillus for 48 hours and adding 0.001% of trypaflavine, which conserves its power for two months at least. The results obtained in practice are excellent. Of 46,630 hogs vaccinated in infected regions, only two died of erysipelas, while in the same regions more than 300 deaths occurred among non-vaccinated hogs.

[113] Kondo and Sugimura. Etudes expérimentales sur un vaccin vivant contre le rouget. Abs. Jap. Soc. of Vet. Sci., 14:1935, 338 in *Rec. de Méd. Vét.*, 112:6, June 1936, p. 366.

ARTIFICIAL IMPREGNATION

Interest in artificial impregnation has become unusually keen.[114] Its advantages are well known. It overcomes sterility due exclusively to vaginal and cervical troubles and enables the breeder to fecundate more than one female per service. But, not the least advantage is the opportunity afforded to make a critical examination of the semen ejaculated. The indications are certain malformation of the cervix; sclerosis of the cervix; rigid cervix incapable of dilating at the time of estrum; vaginismus; and the presence of spermatotoxic material in the vagina. On the side of the male, there is to consider, too violent service and premature ejaculation.

The intervention comprises three problems: collection, conservation, and inoculation of the semen.

The author prefers the sponge method of collecting semen. Two sponges are needed, one to collect the semen and one to cleanse the vagina and cervix. A glass capsule or a simple coffee cup boiled in alkali will serve as the receptacle for the semen. A 10cc syringe and a semi-rigid rubber catheter is used to make the inoculation.

When the vagina has been cleansed with an antiseptic irrigation and perfectly dried, the sponge, previously boiled in a 5% solution of sodium bicarbonate, is placed in the vagina against the cervix. The service should be preceded by a cleansing of the male's sheath. After the service, the sponge is removed and its content of semen squeezed into the cup. To do the inoculating, the cervix is drawn backward with Albrechsen's forceps and the rubber catheter inserted into the cervical canal whereupon the semen is drawn into the syringe and injected.

In the mare the amount of semen injected is from 5 to 10cc, in the cow, about 1cc, and in the ewe, about 0.5cc. The opportune moment to practice fecundation is at the final phase of estrum.

The fact that 60% of previously sterile cows treated conceived speaks well for the procedure.

[114] Ravagilia, F., Practical Application of Artificial Fecundation in Some Cases of Sterility. Abs. *La Nouva Veterinaria*, Jan. 15, 1935, in *Rev. Vét.*, June, 1935, p. 273.

PYOTHERAPY, ITS MECHANISM. ITS EFFECTS

Pyotherapy was introduced into veterinary medicine by Berlin and Velu for the treatment of epizootic lymphangitis and has been used with success by Montbet, in mammary furunculosis by Ledec, in nasopharyngeal affections by Benelmans, and in the pulmonary form of Carre's disease (canine distemper) by Robin and Myleg.

The author[115] mentions the good effects of this method in the therapy of the respiratory complication of canine distemper, metritis, coryza of the cat, and purulent affection of the eyes, sinuses, guttural pouches, and mammae.

The vaccine is prepared by collecting pus in a sterile vessel and adding progressively four times the amount of ether and agitating vigorously. The mixture is left 24 hours at room temperature with the vessel hermetically sealed; then an amount of normal salt solution equal to that of the ether is added. The augmented mixture is then well agitated and injected either subcutaneously or intravenously, every 2 to 3 days in 1 to 2cc doses for small animals and 4 to 5cc doses for large animals.

Dumas believes that this method should take a place in the first rank in the veterinarian's therapeutic arsenal, not as a panacea, but as a valuable adjuvant to surgical interventions and in the purulent affections mentioned above.

POISONING BY MILK VETCH

For a number of years[116] ranchers in northwestern Colorado have been losing cattle and sheep from an unknown cause. The ranges on which losses occur have, in the main, an elevation of 7,500 to 8,500 feet. The losses occur principally in the months of July and August. An investigation continued through three seasons discovered the trouble to be a plant poisoning caused by the timber milk vetch—*Astragalus hylophilus.*

[115] Dumas. La Pyothérapie. Son mechanisme. Ses effets. Thèse, Toulouse. Abs. *Revue de Médecine Vétérinaire et Journal de Médecine Vétérinaire,* 88:6, June, 1936, p. 352.

[116] Newsom, I. E., Cross, Floyd, McCrory, B. B., Groth, A. H., Tobiska, J. W., Balis, Earl, Durrell, L. W., Smith C. E., and Stout, E. N. (1936). Timber Milk Vetch as a Poisonous Plant; Bul. 425, Colorado Agr. Exp. Sta.

Book Reviews

Control of Animal Parasites, General Principles and Their Application. By Maurice C. Hall, Ph.D., D.Sc., D.V.M., Washington, D. C. 162 pages, illustrated. North American Veterinarian, Evanston, Ill., 1936. $2.00.

With little knowledge of military science and perhaps less of parasitology, one approaches the reviewing of Dr. Hall's book with fear of not being able to do it justice.

The author has given to those interested in parasites and their control many new plans of procedure. How useful these plans will be to those in field work can only be appreciated by those having had such experience.

As the author states, the book deals with general principles and their application, which have been quite generally unknown to those depended upon to fight the battles against parasites.

With the use of this book should come closer cooperation between veterinarians, physicians, and those doing research. All forces should receive just consideration of the positions held.

It is with regret that it is noted in the press the change of Doctor Hall to the Bureau of Public Health. This is a loss to the veterinary profession which, as far as its part in the control of parasites is concerned will never be overcome.—*J. N. S.*

2. How to Ship Dogs.—
3. The Dog in the Show Ring.—
4. Dog Shows and Rules.—
7. Housebreaking the Dog.—
10. Anatomy of the Dog.—
11. Puppies and Their Care.—
12. How to Sell Dogs.—By Will Judy, editor of Dog World Magazine, Chicago. 16 pages each, illustrated. Judy Publishing Company, Chicago, 1936. 25c each; three for 50c; seven for $1.00; eight or more, 13c each.

These booklets comprise seven of a series of twelve by the versatile editor of the Dog World. The remaining booklets of the series are: 1. Feeding the Dog; 5. Laws About Dogs; 6. Whelping of Puppies; 8. Handling the Mating of Dogs; and 9. Stud Dog's Care and Management. The subjects discussed are sufficiently indicated in the titles.

Some of these booklets would seem useful for veterinarians to have in stock, to hand to dog owners in need of the information given. They may, on occasion, save the veterinarian considerable time in imparting the information.

The booklets are both humorously and instructively illustrated, in a way to impress upon the reader the points made in the discussion. The author's knowledge of the subjects discussed is indicated by the following quotation from "Dog Shows and Rules," giving impressions of a dog show:

"Barking—catalog seller shouting—sawdust—people conversing in groups—well-gowned women—more humans chattering—ribbons everywhere—barking—table of silver trophy cups—dogs pulling on leashes—the superintendent explaining to a deaf woman why her entry was omitted—serious-looking judges—barking—dog crates—beautiful women—pekes barking at danes—antiseptic sprayed on sawdust—barking—yelping—barking—dogs sleeping on silk cushions—friends greeting one another—fat men leading chihuahuas—wives leading husbands—beginners explaining fine points of game to old timers—barking—argument at door about a pass—superintendent running six ways at one time—beautiful exhibitor smiling at judge—more chattering by humans—barking—dog magazine solicitor extolling his publication at so much per year—winner of yellow ribbon parading joyfully back and forth—Lovers' alibis—checking out their crates—gentleman demonstrating why his dog should have won—barking—lights out—final bark."

His love of dogs is indicated by the following from "Puppies and Their Care:"

"The puppy is the perfect example of trusting loyalty. To him all the world's a friend, a stranger to be greeted. Not only each day but each moment of each hour of the day, the puppy discovers something new in this world of men, in which he must live. Life is one endless experience of play, discovery, and thrills. Not a care worries his carefree soul. No scene on this earth holds more genuine happiness than that of a litter of playing puppies."

His sympathy for dogs, by the following from the same discussion:

"Nothing is more courageous nor more pathetic than a two-months puppy torn from its mother's soft, warm breasts and away from its brothers and sisters, pushed into a crate, shaken on a long journey, and thrust upon strangers in its new home, each one of whom quickly insists upon handling it.

"The slats are torn off the crate—a noise enough to terrify an old dog. The little bunch of soft fur is cold, hungry and trembling after the roughness and loneliness of travel. Alone in the world, far from home and playmates, it looks out of the crate with trusting yet frightened eyes; it hesitates as it is placed on the floor. It looks about only to be disappointed for it had fancied, back in its head, that in some way, at the end of the journey, mother and the rest of the family would be there to welcome it and romp in play.

"But the pat of a kindly hand, a saucer of warm milk, a few soft words, and behold—the tail wags, the eyes become less drawn and out of them a soulful expression looks up at you pleadingly. The legs begin to walk, and within ten minutes a miracle has happened—the stranger in a strange land forgets the crate, the tumbling, and the cold, begins to explore his new home, each crack and corner of it, and ten days later, owns the house and everything in it."

The low price at which the booklets are supplied in quantity should assure them a wide field of usefulness.

* * * *

A RAPID CHLORINE TEST FOR MASTITIS

The determination of the amount of chlorine in milk is considered by various investigators, notably Hucker and Rosell, to be one of the most important and most accurate tests for diagnosing mastitis, especially in the early stages of the disease. It is based on the fact that when udder tissues become infected, they allow the salts of the blood plasma to filter through into the milk. Thus an increase over normal chlorine titre usually indicates an abnormal udder. The chlorine titre (per cent of chlorides expressed in terms of chlorine) of normal milk has been recognized as varying from .08% to .14%. Milk having a chlorine titre of .15% or more is considered by the majority of investigators to be normal, while milk showing .14% to .15% chlorine should be regarded with suspicion.

The milk of some animals normally has a lower chlorine content than others. The factors influencing this are the breed and the variation of fat content within the breed. In Holsteins as a breed the chlorine content of the milk is higher within the normal range than in Guernseys and Jerseys. Individual variations within breeds should be borne in mind. There could be a considerable chlorine rise within the recognized normal range at the onset of mastitis.—*E. R. Carlson.*

A. THEILER IS DEAD; NOTED VETERINARIAN

Received British Knighthood in '14 — Served South Africa for Thirty Years

MASTERED MANY PLAGUES

Work on Tropical Diseases of Animals Won High Honors of Scientific World

Special Cable to THE NEW YORK TIMES.

LONDON, July 24.—Sir Arnold Theiler, veterinary scientist, for thirty years employed in the service of successive South African Governments, died here today at the age of 69.

His career was one long struggle with an eventual mastery over many diseases of animals which thwarted the agricultural development of South Africa for a century. He was pre-eminent in the investigation of diseases of animals in warm climates.

His work threw a flood of light on east coast fever, horse sickness, heart water, blue tongue, lamziekte and biliary fever, plagues which long had inflicted heavy losses on farmers in many parts of the world and prevented any serious agricultural development of South Africa.

Sir Arnold, who received his knighthood in 1914, lived in South Africa from 1891 until his retirement in 1927. A native of Switzerland, he received his professional education at the Universities of Bern and Zurich. He had held many important positions as a veterinary expert in South Africa, among others those of Professor of Tropical Veterinary Medicine at Transvaal University College, 1920-1927, and dean of the Faculty of Veterinary Science of the University of South Africa, 1923-27.

He was the first to receive the grant and medal of the South African Association for the Advancement of Science. His other awards included the Scott Medal of the African Biological Society and the Gold Medal of the Society of Exotic Pathology of Paris.

In August, 1934, while attending the International Veterinary Congress in New York, he received the Budapest Medal, which is given every four years to the author of an outstanding work in veterinary science.

Sir Arnold married in 1893 Miss Emma Jegge of Sisseln, Aargau, Switzerland. There were two sons and two daughters.—*New York Times*, July 25, 1936.

It is significant that in the absence of political or official connections and with no claim to fame other than the very substantial one of having achieved largely in animal medicine, usually a matter of little "news" value, news of Sir Arnold's death and an account of so much of his life work should have been deemed worthy of cabling from London to a New York newspaper.

SIR ARNOLD THEILER
1867-1936

From a photograph taken on shipboard by Dr. J. Russell Greig. Sir Arnold, a member of the British delegation, was en route to New York at the time to attend the Twelfth International Veterinary Congress, August, 1934.

Sir Arnold Theiler was well known in this country, nearly every part of which he had visited on one or another of his journeys to America. His work is even better known. His publication of his discoveries concerning aphosphorosis on the South African veldt, at once solved a problem that had puzzled American veterinarians and American cattle owners for years. His recent lectures at the Royal Veterinary College on osteodystrophia and particularly on skeletal diseases of the horse were followed in America with the greatest interest, for skeletal disease of the horse is probably economically the most important disease of that animal in this country.

Sir Arnold Theiler played an important part in the last two International Veterinary Congresses, at London and New York. No one will be missed so much at the Congress in Switzerland in 1938.

THIS VETERINARIAN RIDES A HOBBY

Do you have a hobby? You should—maybe more than one. We all ride something. It is folly to expect us always to walk. The cheapest thing to ride is a hobby; it eats no oats; it demands no groom; it breaks no traces; it requires no shoeing, gasoline or oil. Moreover, it is safest; the boisterous outbreak of the children's fun does not startle it; three babies astride it at once does not make it skittish. If, perchance, on some brisk morning it throws it rider, it will stand still until he climbs into the saddle again. A hobby fills an important place when we are through with the day's work incident to our necessary vocations. If you are not now blessed with a hobby, adopt one. For a man who is always plunging head long into his business to the exclusion of everything else, a limit will be reached ultimately. He will suffer mentally, if not physically.

Cultivating a hobby of some kind gives a man the necessary diversion to keep him in better fettle. He has some interest outside of his business—it may even be a profitable hobby. But whatever its nature, a hobby is one way of dispersing energy over wider fields, of making the individual more elastic. It provides the necessary diversion, instead of centering his whole life on one interest—his profession or vocation. Following a hobby tends to round out the individual—gets him out of a groove or rut, and until a man blunders into some sort of diversion or pet hobby, he never knows what pleasure he can get out of having one. A hobby need not necessarily be away from your vocational pursuit—nor is it for Dr. Wm. P. Collins, Washington D. C.

Many veterinarians like to play poker—stud poker—but Doctor Collins' hobby is of another variety. He is a breeder and exhibitor of high-class Boston terriers, of which he has been an admirer for over 30 years. During that time he has raised three champions, among them Champion Trimount Harper, now seven years old, a rich, dark, mahogany brindle, with perfect full white markings; one of the most symmetrical Bostons alive, standing unrivalled as a sire. Then there was also Champion District Boss. Doctor Collins sold him and he is now in California, and Champion Maybe.

For the benefit of those who may not be familiar with championships in the dog circuit, it may be explained that the best dog at each dog show gets a certain number of points, according to the rating of that show, and when he gets 15 points, he gets a certificate of championship.

Doctor Collins likes the Boston terrier. He was born and reared in the old baked-bean-and-brown-bread town, and even today he owns a summer home at Gloucester, Mass. In his office, you will find some fine pictures of horses and dogs which at once proclaim his hobby—and incidentally, his profession.

He also likes the Boston terrier because of the amiable disposition of the dog. "It is the only small dog that we have for a house pet in the city that does not require a lot of exercise," explained Doctor Collins, "and he is good to look at. There is no shedding of long hair all over the house because he has short hair. Some Bostons are very good watch dogs and unlike most other dogs, the Boston is easy to house-break at the age of six months. The good ones bring bigger prices than any other dog we have in America."

"Of course, I like all dogs," he continued, "but the Boston terrier is a hobby with me. It is probably one of the most difficult dogs in the world to whelp. They average at least 50% cesarean operations, because of the large heads of the puppy and the small pelvis of the mother."

And, speaking of cesarean operations, Doctor Collins, one of the pioneers in doing such operations in Washington, has performed as high as seven cesareans on one particular female and three or four operations on any number of them. "After the second cesarean, I generally recommend that they be bred no more," he said, "because every one thereafter is just a repetition and I do not like to subject dogs to too many cesarean operations for commercial purposes."

FRED E. KUNKEL.

Washington, D. C.

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CONGRESS "PERMITTED FREEDOM OF ACTION"—ON SOME THINGS

The recent session of Congress has been a momentous one to the Farm Bureau, which will be recognized from a study of a summary of Washington Activities.

The Executive Committee, early in January, selected certain major projects and minor projects, but permitted freedom of action on miscellaneous projects which are in line with Federation policies, according to their merits, and following prior attention given to the needs of the major and minor projects.

The score board of Farm Bureau activities at Washington during the recent session shows the following:

42 legislative projects in all, counting the appropriation and the revenue measure, each, as one;

53 legislative projects in all, counting the individual items in the appropriation and the revenue measures;

24 legislative projects supported by the Farm Bureau and enacted;

12 legislative projects supported by the Farm Bureau with progress made;

9 legislative projects opposed by the Farm Bureau and defeated;

2 legislative projects opposed by the Farm Bureau and enacted;

3 legislative projects favored by the Farm Bureau and defeated.—*Missouri Farm Bureau News.*

DR. EICHHORN'S VISIT TO THE ARGENTINE*

The date of May 5th marked the arrival on these shores of Dr. Adolph Eichhorn, undoubtedly one of the most widely-known veterinarians in the United States of North America. Dr. Eichhorn was formerly a professor on infectious diseases and meat hygiene in George Washington and New York Universities and was also for 16 years head of the Pathological Division of the United States Bureau of Animal Industry, which post he left to occupy that of Director of the Veterinary Department of the Lederle Laboratories of Pearl River, near New York.

As a representative of the United States, he has attended all biological, bacteriological, pathological and infectious disease congresses held during the last 30 years in the United States and Europe. As a special delegate, he was present at the International Veterinary Congresses, taking an important part at Budapest in 1905; at London in 1914, and again at London in 1930, and was Chairman of the Organizing Committee of the 12th International Veterinary Congress in New York in 1934.

Since his arrival in Buenos Aires, Dr. Eichhorn was constantly accompanied by a reception committee appointed by our directors, including Drs. Nicolás T. Suárez and Alejandro Marshall, Dr. César Zanolli (our director of Animal Husbandry), our president, Dr. Jorge Reibel and many other colleagues. Several refrigeration plants were visited, as well as the Municipal Abattoir, the Bacteriological Institute, the cattle markets and several dependencies of the Ministry of Agriculture. A short time was also spent at the laboratories and cattle establishment of the Sancti Spiritu company in Santa Fé. On special invitation, he attended our First Scientific Session on May 15th, the session being dedicated to Dr. Eichhorn by our chairman, Dr. Augustín N. Candioti. At the audience's insistence, Dr. Eichhorn delivered an extemporaneous but eloquent discourse on veterinary work in the United States and the veterinarians' contributions in the war against cattle diseases to the benefit of the public. Dr. Alejandro Marshall obliged with a Spanish version for those unable to follow the original speech.

Through the active coöperation of Drs. Tomás Calio and Nicolás T. Suárez, a dinner in Dr. Eichhorn's honor was organized and served at the Alvear Palace Hotel. Dr. Eichhorn gave a farewell dinner at the City Hotel on May 22nd, the day following, at which time our president, Dr. Jorge Reibel, expressed our appreciation in these words:

"Dr. Eichhorn—Your cordial hospitality is proof of your extreme kindness and will remain an imperishable memory.

"Since your arrival, you have so conquered our sympathy that today, even though your stay has been short, you have revealed such spontaneous frankness and engaging sincerity that we consider ourselves as very old and close friends.

"And so, Dr. Eichhorn, you leave behind you, in the Argentine, friends who are honored to have known you and regret indeed your impending departure, for our dearest wish would have been to intensify the feeling of pleasant spiritual communion felt in your presence.

"We need visitors of your type. Great scientific and economic problems are not solved by persons unknown to each other, but rather is confidence in procedure gained only by a mutual knowledge.

"On the other hand, we are aware of the giant strides which your country is taking in veterinary medicine in all its branches.

"When, a few days ago, our Society of Veterinary Medicine was asked by the Minister of Agriculture to express its views regarding measures necessary to the stimulation and sanitation of the cattle industry within the radius of the Department of Animal Husbandry's activities, our Society adopted the accomplishments and progressive methods now in use by your own Bureau of Animal Industry as a model.

"Allow me, Dr. Eichhorn, to request, as president of the Society of Veterinary Medicine, that, upon your return to the great northern republic, you extend a fraternal greeting to our American colleagues and express our desire for close and sincere coöperation in all matters pertaining to the defense of our mutual professional and scientific interests on behalf of our respective homelands.

"In conclusion, may I state, on behalf of all present, that your fine courtesy is indeed esteemed; and, as the hour of separation approaches, let us wish you Godspeed."

Dr. Eichhorn sailed aboard the S. S. "Western Prince" on May 23rd and, as proof of the high regard attained during his short visit, it might be said that not one of the veterinarians who enjoyed the pleasure of meeting him was absent from the pier.

Dr. Eichhorn has promised us material for publication in our journal, Revista de Medicina Veterinaria (Review of Veterinary Medicine) and our pages will soon be honored with his name. He has promised to return to this country for a longer stay and will, at that time, be able to hold a scientific conference with the Society.

* * * *

TESTERS ON VACATION

The farmers of Johnson County have been so busy in the field that they have not had time to coöperate with the testers who are doing the Bang's disease testing in that section. The latter have therefore taken two weeks' vacation and were expected to return the first of July to finish up the work, reports County Agent Burk.—*Missouri Farm Bureau News.*

Probably the veterinarians engaged in this work will be called "bleeders" next.

* Translation from *Revista de Medicina Veterinaria*, Vol. XVIII, No. 5, May, 1936, pp. 267-270 (publication of the Society of Veterinary Medicine of Buenos Aires).

IMPENDING RETIREMENT OF PROFESSOR HOBDAY

The impending retirement of Professor Sir Frederick Hobday through reaching the age limit is causing the Governors of the Royal Veterinary College to be confronted with the all-important task of selecting his successor at a very critical time in the history of the Veterinary Profession.

The new Principal will have to take over the new College buildings, which will be completed during the next year, and be responsible for their equipment and staffing. On his powers of organization and of administration will turn to a very large extent the efficiency of the Veterinary Profession in future years.

The Governors are seeking a new Charter from the Privy Council under which will be formed a new Court of Governors and a new Council. This new governing body will have no easy initial task in making the appointment of a Principal. In order that the change over may be gradual Sir Frederick will remain in office until the opening of the new buildings, but will go on leave as from October 1st next in order that his successor may be responsible for the organization of the buildings which will be under his control in future.

The Governors have felt that Sir Frederick Hobday's official connection with the College should not be terminated until the new buildings, for the erection of which he has worked so hard and successfully, were completed and formally opened.—*The Times* [London].

EIGHT YEARS' LOSSES OF PULLET LAYERS

The increasing losses of pullet layers have become the greatest problem confronting the poultry industry. There are innumerable causes for the losses from culls and mortality of pullet layers. Those of some of the most baffling complications, such as fowl paralysis, typhoid, leukemia or leucosis ("big liver disease"), and cholera-like diseases, are not clearly understood nor is there a means of prevention, control, or remedy.

A survey of poultry farm demonstration records of a number of states, secured under the supervision of state poultry extension specialists, reveals that the average first-year flock reduction of pullet layers is 40 to 60 per cent, 15 to 20 per cent of which is due to mortality and the balance due to removal of culls. If allowance is made for the fact that some of the culls can generally be marketed, we still face the fact that about half the pullets that go into the laying house fail to complete their first laying year. Added to this is the incidental loss of eggs and the average loss of the use of about 25 per cent of the housing capacity for the entire year. This gives an abstract picture of the losses from culls and mortality faced by many poultrymen today. Beginning and prospective keepers should familiarize themselves with and be aware of this side of the poultry business.

The average first-year mortality (no culls removed) of pullet layers at this station, in 1921-1924 was 13.2 per cent; in 1925-1928, 38.4 per cent; and in 1929-1935, around 60 per cent. We suspect this picture and the factors responsible for the increased mortality may to a large extent be comparable to what has been taking place throughout the country at large.—*D. C. Kennard, Ohio Agr. Exp. Sta.*

MILK BORNE EPIDEMICS, 1935

Contaminated milk and other dairy products were responsible for 42 epidemic outbreaks involving 1,993 cases of illness and 21 deaths in the United States during 1935 according to a report by the United States Public Health Service. The diseases included 18 outbreaks of typhoid and paratyphoid fever; 9, septic sore throat; 7, gastro-intestinal disturbance; 5, food poisoning; 1, scarlet fever; 1, dysentery. All of the milk supplies concerned were raw except three and the pasteurizing process was faulty in these.

Investigation revealed that a *carrier* at the dairy was the source of each of 9 of the typhoid outbreaks while one or more cases of this disease were found on the incriminated dairies in 6 instances. The specific source of infection was not found in the other three typhoid outbreaks.

The sources of the 9 outbreaks of septic sore throat were, respectively, carrier (2), infected finger (2), infected cow (2), patient (2), infected milk (1).

The 7 epidemics of gastro-enteritis were attributed to sweet milk (5), cream cheese and ice cream.

The responsible agents for the 6 outbreaks of food poisoning were sweet milk (3), cheese, filler in cream puffs and ice cream.

An infected finger of a milk handler was responsible for the scarlet fever outbreak while the source of the dysentery epidemic was a carrier.

A rather significant observation is that all but 14 of the 42 outbreaks were in communities of less than 5,000 inhabitants. This doubtless arises from the fact that supervision over milk supplies in the small communities is less adequate and efficient than in the larger municipalities.

Three of the epidemics of typhoid fever occurred in Illinois. These were at Grand Tower, Litchfield and Windsor. A total of 57 cases and 8 deaths was involved in these three Illinois outbreaks, all attributed to the use of contaminated raw milk.

This experience with milk borne diseases emphasizes anew the importance not only of pasteurization but of *efficient* pasteurization of milk supplies. No epidemic has been traced to a pasteurized milk supply in Illinois. Where an alleged pasteurized milk supply has been responsible for transmitting disease, evidence of faulty process or of faulty handling after pasteurization has been found.—*Illinois Health Messenger.*

The importance of GOVERNMENT INSPECTED FRESH, LEAN, RED MEAT in canned dog food

● Available or usable protein is the most important substance in a proper dog diet. And the best source of available protein is *fresh, red meat.*

The mere statement of protein percentage on a canned dog food label is no assurance that the proteins are *usable* and that they contain the essential amino acids, because all proteins are *not alike.* Waste "meat" may be high in protein content but dangerously weak in actual nutritive value.

The four essential amino acids are contained in the protein of fresh, red meat. That is why Ken-L-Ration is made with fresh, raw, lean, juicy red meat. And in order to obtain the finest, most nutritive fresh, red meat, Chappel Bros. produce it themselves on 1,600,000 acres of Western range country.

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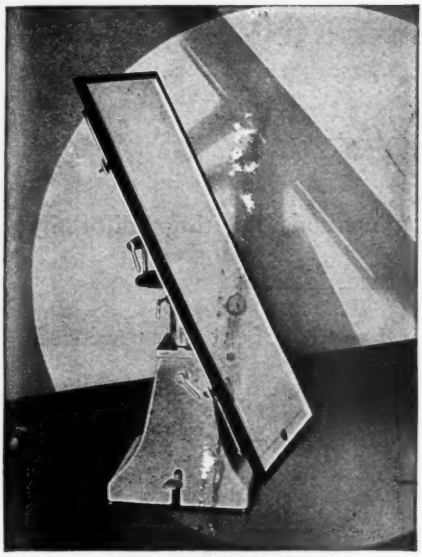

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ARMY VETERINARY SERVICE

First Lieut. Donald C. Kelly is relieved from further assignment and duty at Fort Snelling, Minn., and will proceed to Fort Riley, Kan., for duty.

Captain Wesley W. Bertz is relieved from further assignment and duty at Fort Bliss, Tex., effective in time to proceed to San Francisco, Calif., and sail on transport scheduled to leave that port on or about August 22, 1936, for New York, N. Y.; upon arrival in New York will proceed to Carlisle Barracks, Pa., for duty.

Major Fred C. Waters is detailed in addition to his other duties at Seattle, Wash., as attending veterinarian at Fort Worden, Wash.

Major Clifford E. Pickering is, in addition to his other duties at Fort MacArthur, Calif., detailed as attending veterinarian at March Field, Calif.

Lt. Col. William H. Houston is assigned to duty at headquarters, Fifth Corps Area, Fort Hayes, Ohio, effective upon completion of his present tour of foreign service in the Philippine Department.

Major Irby R. Pollard is assigned to duty at Fort Benjamin Harrison, Ind., effective upon completion of his present tour of foreign service in the Philippine Department.

The promotion of the following-named officers of the Veterinary Corps is announced:

Major Mott Ramsey to grade of lieutenant colonel with rank from July 11, 1936.

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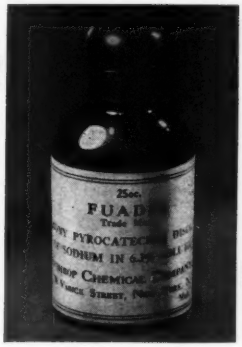

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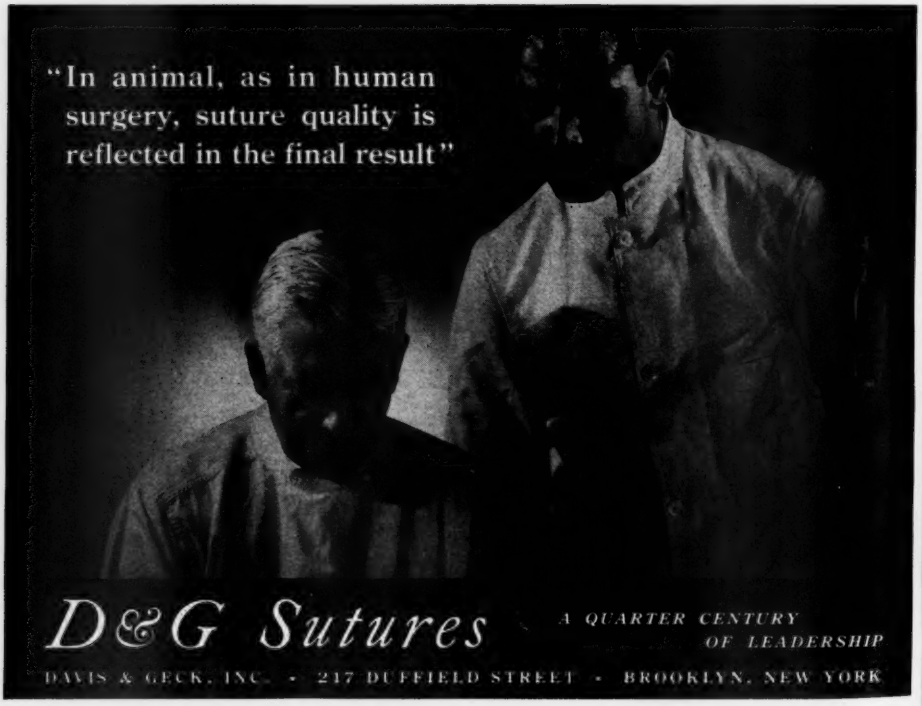
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Major Gerald W. FitzGerald to grade of lieutenant colonel with rank from July 19, 1936.

First Lieutenant Robert A. Boyce to grade of captain with rank from July 12, 1936.

First Lieutenant Wayne O. Kester to grade of captain with rank from July 8, 1936.

First Lieutenant Clarence L. Taylor to grade of captain with rank from July 18, 1936.

Captain Richard G. Yule, Fort Myer, Va., is directed to report to the commanding officer General Dispensary, U. S. Army, Washington, D. C., for duty for approximately one month, effective August 3, 1936, in addition to his other duties, during the absence on leave of Major Chauncey E. Cook.

Captain Harvie R. Ellis is directed, upon arrival at New York from temporary duty in connection with the Olympic games in Europe, to proceed to Washington, D. C., and report to the commanding officer, Army Medical Center, for temporary duty for approximately one month for the purpose of pursuing post-graduate instruction at the Army Veterinary School, and upon completion to return to his proper station, Fort Riley, Kan.

Major Charles M. Cowherd is directed to report

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to the Commandant, Chemical Warfare School, Edgewood Arsenal, Md., for temporary duty for the purpose of attending the Field Officers' Course, beginning July 5, 1936, and upon completion of this course to return to his proper station, Fort Hoyle, Md.

Veterinary Reserve Corps

New Acceptances.—(First Lieutenants) Britton, Wm. Stowell, Britton, Mich.; Canfield, Rolden Ferrington, Spokane, Wash.; Cantrall, Emmett Wesley, Santa Barbara, Calif.; Decker, Harold Leon, Burr Oak, Mich.; Johnson, Cecil Haley, Simpsonville, S. C.; Kerr, Virgil Milo, Sacramento, Calif.; Kriesel, Henry Richard, Brooklyn, N. Y.; Metcalfe, Elmer Lewis, Plymouth, Neb.; O'Neill, John Luther, Troy, Ohio; Schwabland, John

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Promotions.—(To Captains) Currie, Arthur James, Greenwood, Wis.; Evans, Tom, Pueblo, Colo.

(To First Lieutenants) Bader, Madero Norman, Galveston, Tex.; Cox, Danford Lodge, Madison, Wis.; Day, Robert Wayne, Columbus, Ohio; Dorgan, Wm. Francis, Columbus, Ohio; Finke, Elmer Fred, Buckner, Mo.; Fischer, Sebastian Benedict, Southold, N. Y.; Frank, Edward Raymond; Manhattan, Kan.; Hook, Crosby Johnson, Akron, Ohio; Johnstone, Clarence Barney, Baton Rouge, La.; Jurden, Richard Hulett, San Carlos, Calif.; Loveland, Benj. Bristol, Oneonta, N. Y.; Moats, Arthur Evans, Waverly, Ohio; Nichols, Roy Elwyn, Columbus, Ohio; Schafer, Frederick Neice, Sauquoit, N. Y.; Versluis, Hendrick, Farmingdale, L. I., N. Y.; Younce, Ralph Ray, Wellington, Colo.; White, Samuel Ray, Charleston, W. Va.; Wohnsiedler, George, Carthage, N. Y.; Apple, Henry Jackson, Columbus, Ohio; Brown, Roswell Leo, Evanston, Ill.; Gingras, George Edward, Malone, N. Y.; Green, Charles Frederick, Jr., DeWitt, N. Y.; Guthrie, Richard Sidney, Hillsdale, N. Y.; Krill, Walter Roland, Columbus, Ohio; McFadden, Glenn Melvin, Natoma, Kansas; Micuda, John, Laurel, Md.;

SWINE DISEASES

The cooperation of practitioners in supplying specimens has enabled us to accumulate a fund of information relative to the nature and prevention of numerous swine diseases. This information has not only been given direct to the practitioner by letters, but also to the entire profession in discussions at meetings and in published articles.

Present indications are that various swine diseases may be quite prevalent within the next few weeks.

Enteric and Pulmonary disorders may occur in swine that have not been vaccinated with anti-hog cholera serum, in cholera immune swine, and as complications of cholera.

Best results from cholera vaccination are obtained only when healthy herds are treated. Swine sick of disease other than cholera should be properly treated prior to the use of serum and virus.

Kinsley's Mixed Bacterin Swine will be found par-excellent in controlling suipestifer and para-typhoid enteritis, pulmonary oedema and hemorrhagic septicemia.

The method of procedure will depend upon the prevailing conditions. Swine affected with bacterial pulmonary or enteric disorders that are immune to cholera or unvaccinated should be given Mixed Bacterin Swine (Kinsley). Swine affected with cholera complicated with bacterial, pulmonary or enteric disorders should be given Mixed Bacterin Swine (Kinsley) in addition to the usual cholera immunization.

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Thiele, Mervin Ivan, Prescott, Iowa; Thomas, Owen Ellis, Granville, Ohio.

Separations.—Major John Doerr, Melbourne, Ia. —Died September 18, 1935; Captain Burton Wesley Conrad, Sabetha, Kan.—Died March 14, 1936.

New Assignments to Active Duty with CCC.—(First Lieutenants) McGee, Lucius E., Pres. of San Francisco, Calif.; Zedlitz, Alfred Charles, Fort Worth Dist., Fort Worth, Tex.; Kuhn, George Anson, Fort Snelling, Minn.; Morgan, Donald R., 1st Lt., Vancouver Barracks, Wash.; Hieberding, Joseph F., Ft. Worth Dist., Fort Worth, Texas.

Termination of Assignment to Active Duty.—Major Jay G. Townsend, Vancouver Bks., Wash.; Capt. Earl T. Martin, Redding, Calif.; First Lieutenants Nels Frank Christensen, Lubbock Dist., Lubbock, Tex.; Lawrence Charles Donat, Fort Crook, Neb.; Herbert J. Buell, Fort Totten, N. Y., and Donald C. Kelley, Ft. Snelling, Minn., (Appointed 1st Lt. in Regular Army).

Members recently appointed on the Veterinary Examining Board for New Jersey, comprise: W. B. Maxson, Flemington; W. F. Harrison, Stockton; Arthur Ward Smith, West Orange; James M. Herron, Bordertown, and Arthur Goldhaft, Vineland. The Board is appointed for a three-year period.

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HADLEY QUESTIONS

(Continued from page 346 of the August issue of VETERINARY MEDICINE*)*

In each of the multiple choice tests, four answers are suggested. Place a cross (×) in the space following the answer which you consider best or most nearly correct.

26. Of the following infectious diseases only the one checked is not communicable:
   a. Tuberculosis ..... a.....
   b. Tetanus ..... b.....
   c. Anthrax ..... c.....
   d. Hemorrhagic septicemia ..... d.....

27. Of the following antibodies only the type checked has no protective value:
   a. Antitoxins ..... a.....
   b. Cytolysins ..... b.....
   c. Bacteriolysins ..... c.....
   d. Agglutinins ..... d.....

28. The most effective immunity is that known as:
   a. Spontaneous ..... a.....
   b. Induced ..... b.....
   c. Natural ..... c.....
   d. Passive ..... d.....

29. The one of the following organisms which is characterized by producing spores is the:
   a. *Bacillus tuberculosis* ..... a.....
   b. *Bacillus anthracis* ..... b.....
   c. *Streptococcus pyogenes* ..... c.....
   d. *Bacterium mallei* ..... d.....

30. The one of the following biologic products which is germ-free is:
   a. Vaccine ..... a.....
   b. Bacterin ..... b.....
   c. Sero-vaccine ..... c.....
   d. Aggressin ..... d.....

31. The infectious disease caused by a protozoan is:
   a. Tuberculosis ..... a.....
   d. Coccidiosis ..... b.....
   c. Actinomycosis ..... c.....
   d. Aspergillosis ..... d.....

32. By the virulence of a pathogenic microörganism is meant:
   a. Its disease inciting power..... a.....
   b. Its power to adapt itself to unfavorable environment ..... b.....
   c. Its power of reproducing, or tendency to be prolific..... c.....
   d. Its ability to do without free oxygen ..... d.....

33. The agglutination test is used to diagnose:
   a. Johne's disease ..... a.....
   b. Botulism ..... b.....
   c. Bang's disease ..... c.....
   d. Tuberculosis ..... d.....

34. Milk-borne diseases of man are most commonly transmitted:
   a. From the cow through the milk to man ..... a.....
   b. From man to the cow and through the milk to man..... b.....
   c. From man to the milk through contamination ..... c.....
   d. From contaminated water and insects through the milk..... d.....

35. Of the following diseases of man the one checked is carried by the hog:
   a. Trichinosis ..... a.....
   b. Tetanus ..... b.....
   c. Typhoid fever ..... c.....
   d. Tularemia ..... d.....

36. Cestodes are found most rarely in:
   a. Horses ..... a.....
   b. Cattle ..... b.....
   c. Sheep ..... c.....
   d Swine ..... d.....

In each of the incomplete sentences below, supply a word or short phrase which will make the statement true, complete and pertinent.

37. The most recently perfected product to immunize against tetanus is.....

38. A biologic immunizing product known as .....is produced from cultures grown on laboratory media and rendered germ-free by filtration.

39. The organism causing 80-90% of the cases of bovine mastitis is termed.....

40. The condition resulting from a marked reduction in the total number of erythrocytes is known as.....

41. Approximately.....cattle have been tested in Wisconsin since the Bang's disease control project was inaugurated in ....., ...

42. The incubation period of rabies varies from .....to.....

43. The chief lesions (postmortem) of hog cholera are visible in the....., ..., ...and.....

44. The chief protein in milk is termed.....

45. Probably the most common destructive animal parasitic disease of sheep in Wisconsin is caused by.....

46. The biologic product used to diagnose g'anders is.....

47. Next to birds.....are most susceptible to avian tuberculosis.

48. Animal hygiene deals with.....

49. Pathology deals with.....

50. Spontaneous immunity develops as a result of .....

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Mary Jean Baker, 13-year-old daughter of Dr. Frank J. Baker, Gouverneur, N. Y., died in a hospital in Rome, N. Y., July 14, 1936. Besides her father, the deceased is survived by two brothers, her mother having died three years ago. Doctor Baker is County Veterinarian of St. Lawrence County.

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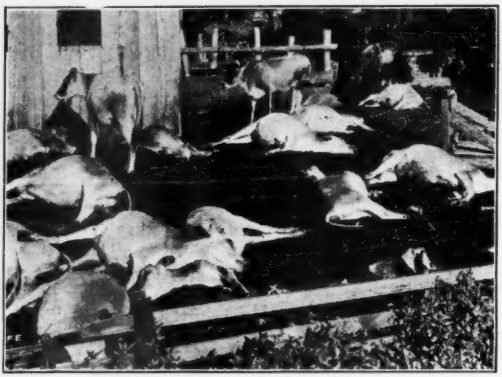

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